



# NI 43-101

# RESOURCE ESTIMATE FOR THE JERSEY-EMERALD PROJECT

Nelson Mining Division, British Columbia Map sheets: 82F.004, 82F.005, 82F.014, and 82F.015 Latitude 49.11°N, Longitude 117.22°E UTM Zone 11: 5439500 N, 484000 E (*NAD 83*)

Submitted to: **Apex Resources Ltd.** Effective Date: July 26, 2021 Date of Submission: September 3, 2021

Submitted by: Moose Mountain Technical Services Sue Bird, M.Sc., P. Eng.

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# **DATE & SIGNATURE PAGE**

Herewith, the report entitled 'Resource Estimate for the Jersey-Emerald Project" with an effective date of July 26<sup>th</sup>, 2021 and dated September 3<sup>rd</sup>, 2021.

"Signed and Sealed"

Sue Bird, P. Eng.

Dated 3 September 2021

Moose Mountain Technical Services Principal and V.P., MMTS





# **CERTIFICATE-** Sue Bird, P. Eng

#### I, Sue Bird, P. Eng., do hereby certify that:

I, Sue Bird, P.Eng., am employed as a Geological Engineer with Moose Mountain Technical Services, with an office address of #210 1510 2nd Street North Cranbrook, BC V1C 3L2. This certificate applies to the technical report titled "Resource Estimate for the Jersey-Emerald Project" that has an effective date of July 26, 2021 (the "technical report").

- I am a member of the self-regulating Association of Professional Engineers and Geoscientists of British Columbia (#25007). I graduated with a Geologic Engineering degree (B.Sc.) from the Queen's University in 1989 and a M.Sc. in Mining from Queen's University in 1993.
- I have worked as an engineering geologist for over 25 years since my graduation from university. I have worked on precious metals, base metals and coal mining projects, including mine operations and evaluations. Similar resource estimate projects specifically include those done for Artemis' blackwater gold project, Ascot's Premier Gold Project, Spanish Mountain Gold, all in BC; O3's Marban and Garrison, gold projects in Quebec and Ontario, respectively, as well as numerous due diligence gold projects in the southern US done confidentially for various clients.
- As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).
- I visited the property between 26 and 28 January 2021 and again between June 28 and June 30, 2021, for a total of 6 days.
- I am responsible for all Sections of the technical report.
- I am independent of Apex Resources Inc. as independence is described by Section 1.5 of NI 43–101.
- I have no previous involvement with the Jersey-Emerald Project.
- I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the sections of the technical report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

#### Dated: 3 September 2021

"Signed and Sealed"

Signature of Qualified Person Sue Bird, P.Eng.





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# 1.0 Summary

Moose Mountain Technical Services (MMTS) has prepared a technical report (the Report) for Apex Resources Ltd. (Apex) for a Resource Estimate of the Jersey-Emerald Project, located in British Columbia, Canada. The Jersey-Emerald Project consists of 120 mineral claims and 45 crown grants. The Jersey-Emerald Project refers to exploration and development activity related to Wo3, Mo, and Au mineralization previously referred to as the Emerald, East Emerald, Invincible, Dodger, East Dodger, Dodger 4200 zone, and Pb and Zn in the Jersey deposit. The previously reported Pb-Zn in the Jersey-Emerald deposit of the property is not included in this Resource Estimate due to uncertainties in the location of previous underground mining voids, assay interval locations, incomplete Pb-Zn assay database, and uncertainties in "reasonable prospects of eventual economic extraction" shapes of the remaining resource due to proximity to the existing openings. All claims and crown grants are currently held by Apex.

# 1.1 Mineral Resource Estimate

The Mineral Resource estimate has been prepared by Sue Bird, P.Eng., of MMTS. Mineral Resources were estimated using the 2019 CIM Best Practice Guidelines and are reported using the 2014 CIM Definition Standards. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Table 1-1 below summarizes the total model resource for the Jersey-Emerald Project which has an effective date of July 26, 2021. The base case cut-off grade within the "reasonable prospects of eventual economic extraction" constraining pit is a Net Smelter Return (NSR) of CDN\$25/tonne for open pit resources and CDN\$60/tonne for underground resources, as highlighted in Table 1-1. The table includes a range of NSR cut-off grades to show the sensitivity of the resource estimate to variations in cut-off.





Table 1-1         Jersey-Emerald Mineral Resource Estimate – Total Project										
Source	Class	Cut-off	Tonnage	NSR	Wo3	Мо	Au	Wo3 Metal	Mo Metal	Au Metal
		AuEq (CDN\$/t)	(tonnes)	(CDN\$)	(%)	(%)	(gpt)	('000 lbs)	('000 lbs)	(ounces)
	Indicated	25	1,045,153	55.04	0.157	0.015	0.029	3,618	334	958
		30	970,440	57.14	0.163	0.015	0.031	3,483	323	958
		35	864,486	60.16	0.171	0.016	0.034	3,255	311	945
		40	739,976	63.93	0.181	0.018	0.039	2,950	289	925
Onen Dit		50	461,891	75.51	0.211	0.024	0.042	2,148	246	628
Open Pit	Inferred	25	1,472,801	63.06	0.175	0.025	0.012	5,689	802	559
		30	1,398,473	64.94	0.180	0.026	0.011	5 <i>,</i> 559	792	504
		35	1,285,247	67.78	0.188	0.028	0.011	5,313	782	471
		40	1,095,164	72.98	0.201	0.031	0.012	4,853	741	412
		50	797,312	83.52	0.227	0.039	0.009	3,994	680	231
Underground	Indicated	within CDN\$60	427,650	82.40	0.213	0.036	0.101	2,007	342	1,387
onderground	Inferred	shape	3,655,244	90.79	0.248	0.026	0.109	20,017	2,087	12,857
Open Pit & Underground at Base Case	Indicated	varies as	1,472,803	62.99	0.173	0.021	0.050	5,625	676	2,345
	Inferred	above	5,128,045	82.82	0.227	0.026	0.081	25,706	2,889	13,415

Notes for Table 1-1:

1. Resources are reported using the 2014 CIM Definition Standards and were estimated using the 2019 CIM Best Practices Guidelines

2. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

3 The Mineral Resource has been confined by a "reasonable prospects of eventual economic extraction" pit using the following assumptions: 150% pit case using an Wo3 price of US\$300/tonne, a Mo price of US\$15.00/lb and an Au price of US\$1600/oz at a currency exchange rate of 0.77 US\$ per \$CDN; 90% payable Au, 99% Mo payable, 3% conversion to APT of Wo3; and typical roasting, refining, transport, and insurance costs. A 1.5% royalty is applied to the NSR calculation.

4. Metallurgical recoveries of 85%, 80% and 75% Tungsten, Molybdenum, and gold respectively.

Pit slope angles are assumed at 45<sup>o</sup>. Mining costs are CDN\$5.00/tonne, and Processing plus General and Administration 5. (G&A) costs of \$25/tonne milled.

6. The specific gravity of the deposit has been assigned as 3.55 in mineralized domains and 3.21 outside domains

7. Numbers may not add due to rounding.

The following factors, among others, could affect the Mineral Resource estimate: commodity price and exchange rate assumptions; pit slope angles; assumptions used in generating the LG pit shell, including metal recoveries, and mining and process cost assumptions. The QP is not aware of any environmental, permitting, legal, title, taxation, socioeconomic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

#### **Terms of Reference** 1.2

All currencies are expressed in Canadian dollars (\$CDN). Mineral Resources and Mineral Reserves are estimated using the 2019 edition of the Canadian Institute of Mining, Metallurgy and Exploration (CIM) Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines (2019 CIM Best Practice Guidelines) and are reported using the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves (2014 CIM Definition Standards).





# **1.3** Project Description and Location

#### 1.3.1 Location

The Jersey-Emerald property, located within the Nelson Mining Division is centered at a latitude and longitude of 49 degrees (°) 06 minutes (′) North (N), 117°13' East (E), within map sheets 82F.004, 82F.005, 82F.014, and 82F.015. The property is located about 10km southeast of the town of Salmo, as illustrated in Figure 1-1 below.



Figure 1-1 Jersey-Emerald Project Location Map (Source: MMTS, 2021)

# 1.3.2 Mineral Tenure

The Jersey-Emerald Project is currently owned by Apex. The Jersey property consists of 120 mineral claims over 16,935.56 hectares (ha) and 44 crown grants over 660.56ha.

# 1.4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Jersey-Emerald claims area is extensive allowing sufficient areal extent for possible future mining operations, including potential tailings storage areas, potential waste disposal areas, heap leach pad areas, and potential processing plant sites. The property is close to numerous towns and cities, being approximately 10km southeast of the town of Salmo. Access from the Nelson-Nelway Highway (Highway 6) is east via Bellmond Rd, between Salmo and the Crowsnest Highway (Highway 3) junction to Creston, north on Airport Rd, and east on Emerald Mine Rd.





The property is situated in the physiographic division known as the Selkirk Mountains. Slopes vary from rolling within the center of the property to moderately steep along the east and west margins.

The climate of the Jersey-Emerald property is typical of the southern interior of British Columbia, with temperatures ranging between  $-20^{\circ}$ C to  $30^{\circ}$ C. It is possible to operate on the property all year round, although snow and ice is seen to hinder some operations.

# 1.5 History

The earliest record of exploration in the area dates to 1895 when gossanous outcrops on the south side of Iron Mountain attracted the attention of gold prospectors. In 1906, prospecting discovered lead mineralization on the Emerald claims. In 1938, tungsten and molybdenite mineralization was discovered in skarn bands at the site of the abandoned gold workings on the Emerald, Emerald Fraction, and Gold Standard claims. In 1942, Wartime Metals Corporation, a federal government agency, put the Emerald Tungsten Mine into production for the war effort. From 1947-1949, 1951-1958 and 1970-1973 Canadian Exploration (Canex) produced Tungsten at the property (Dandy, 1996).

Over the mine life 1,597,802t of tungsten ore grading 0.76% Wo3 were mined and milled. Zinclead production occurred between 1949 and 1970. The Jersey deposit produced 7,968,080t of zinc-lead (Zn-Pb) ore grading 3.83% Zn and 1.95% Pb (Dandy, 1996).

After changing hands three times, Apex Resources Inc., then as Sultan Minerals Inc., optioned the property in 1993 and did additional exploration including diamond drilling, ground and airborne geophysical surveys, prospecting, and rock chip sampling through 1997 and again from 2005 through 2009.

Margaux Resources Ltd. (now Cassiar Gold Corporation) entered an option agreement with Apex (then Sultan Minerals) in November 2013 and completed four programs of exploration between 2014 and 2018, including diamond drilling, geophysical, and LiDAR surveys. Margaux terminated the option agreement with Apex in October of 2018. No additional exploration has been done since.

# 1.6 Geological Setting and Mineralization

The Jersey-Emerald Property is at the southern end of the Kootenay Arc, a narrow arcuate tectonic belt of Paleozoic miogeosynclinal and transitional rocks. It is comprised of mixed carbonates and pelites, subdivided into the Truman Member brown argillite interbedded with thin, grey, and white, locally dolomitic limestone, the Emerald black argillite and the Reeves limestone.

The property consists of rocks of the Laib Formation of transitional rocks comprising mixed carbonates and pelites (Little, 1985). Two narrow, NNE-trending elongate dyke-like bodies of Cretaceous biotite granite, locally known as the Emerald and Dodger ridges, flare from the





underlying intrusive into the sediments of the Jersey anticline. The majority of the mineralized bodies formed along the margins of these ridges.

Mineralization on the Jersey property is associated with the east limb of a complex major anticlinal structure referred to locally as the Jersey anticline and regionally as the Salmo River anticline. Also associated with this structure are the HB lead-zinc mine located four kilometers to the north and the Reeves MacDonald lead-zinc mine located 10km to the south.

Several zones of significant and often very different mineralization have been identified on the property, examples are historically mined areas which produced lead-zinc and tungsten, with known areas of high molybdenum, gold, bismuth, arsenic, copper, silver, cadmium, and barium. The individual tungsten, gold, molybdenum, and lead-zinc zones that have been the subject of historic mining and recent exploration are discussed in this Report.

#### 1.7 Exploration

Between 1994 and 1996 Sultan Minerals (now Apex) undertook diamond drilling, rock, soil and silt sampling, geological mapping, and an airborne magnetic survey. The drilling resulted in the discovery of several gold-bearing zones, and a lead-zinc zone below the former Jersey lead-zinc deposit. Market forces prevented further exploration until 2005 and further drilling and exploration continued through 2009, much of it outside the current resource areas.

In 2014 through 2017 Margaux Resources conducted drilling, geophysical and LiDAR surveys with gold and tungsten as the primary objectives. No additional exploration work has been done.

#### 1.8 Drilling

A total of 5,109 drillholes comprising 194,726m are recorded as having been drilled on the Jersey-Emerald Project. Diamond drilling by operators Sultan Minerals and Margaux Resources have resulted in 226 drillholes and 34,870m, the remainder of the drillholes are historic.

Sultan Minerals drilled a total of 173 diamond drillholes totalling 25,414m between 1994 and 2009. Drilling in 1994-1995 focused on the Jersey Lead-Zinc Deposit and the Emerald Tungsten Deposit. Significant intersections included a lead-zinc zone 55m below the formerly described lead-zinc deposit.

The 2005-2006 drilling was primarily underground in the Dodger 4200 zone in the East Dodger deposit. Significant molybdenum mineralization was intersected with variable grade, the highest in areas with higher fracture and greater vein density. The 2007 drilling was in the East Emerald and East Dodger deposits. Significant tungsten results are reported in holes JS07-22 and JS07-24 with assays up to 4,450ppm.

Margaux Resources drilled a total of 53 holes for 9,455m between 2014 and 2018. The drilling program in 2014 identified additional tungsten mineralization described as mostly persistent parallel skarn bands in argillite or limestone beds that dip moderately to the east. Drilling in 2016 encountered one interval of 6m averaging 0.77g/t, and one interval of 7.9m averaging 0.62g/t in





hole E1601 while hole E1602 intersected two narrow 0.25m intervals with gold grades of 9.79g/t and 59.1g/t.

# 1.9 Sampling and Analysis

Sampling methods and analyses prior to 1994 are not available for review. Sampling methods and analysis of QAQC data by Sultan and Margaux have been reviewed. Analysis of the data indicates that an inappropriate blank material was used for QAQC samples in 2014-2017 drilling due to higher-than-expected assay results for tungsten and molybdenum. The results of the CRMs indicate that the assay method used was incomplete for samples in 2014 drilling in East Emerald and tungsten assays in 2017.

# 1.10 Data Verification

The QP concludes that the database is suitable for resource estimation. Certificate checks were made and any omissions or corrections to the data have been included in the interpolations in the resource areas.

#### 1.11 Conclusions and Recommendations

The QP concludes that the mineral resource estimate contained in this Report warrants further exploration.

The following recommendation are made by the QP:

- Future drilling programs employ QAQC sample inclusion rates consistent with current practice to include blanks, field duplicates, coarse duplicates, and CRMs, and that certified blank material be sourced for future assaying.
- Re-assay of significant intervals of in holes from 2014 and 2017 is recommended due to lower-than-expected results in CRMs and overlimits for tungsten not being done.
- Check assays for gold in 2014 drilling is recommended due to issues with a provisional standard that was used.
- A collar survey is recommended to remove any questions regarding drillhole locations that have been changed to reconcile with topography or errors induced during conversion from mine grid coordinates.
- For drilling outside of the resource area, there are a significant amount of assay values of metals that could be of interest that are not included in the resource database from both historic and non historic drilling. It is recommended a full review of the assay database be accomplished to take advantage of all existing data prior to further resource modeling.





# 2.0 Introduction

Moose Mountain Technical Services (MMTS) have prepared a technical report (the Report) for Apex Resources Ltd. on a Resource Estimate of the Jersey-Emerald Project, located south of Salmo in British Columbia, Canada, approximately 400km east of Vancouver. Apex Resources Inc. is a Vancouver based precious and base metal exploration company focused on British Columbia and the Yukon.

# 2.1 Terms of Reference

All currencies are expressed in Canadian dollars (\$CDN). Mineral Resources and Mineral Reserves are estimated using the 2019 edition of the Canadian Institute of Mining, Metallurgy and Exploration (CIM) Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines (2019 CIM Best Practice Guidelines) and are reported using the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves (2014 CIM Definition Standards).

# 2.2 Qualified Persons

The following serve as the qualified persons (QPs) for this Technical Report as defined in National Instrument 43-101, *Standards of Disclosure for Mineral Projects*, and in compliance with Form 43-101F1:

• Sue Bird, P.Eng., Moose Mountain Technical Services

# 2.3 Site Visits and Scope of Personal inspection

Sue Bird visited the Jersey-Emerald Project site on 26-28 January 2021 and again from 28-30 June 2021. Sue reviewed drill pad locations, drilling and sampling protocols, the core storage, and the QA/QC procedures. The underground workings were examined for all accessible drifts. The geology and mineralization within pertinent drillholes were also inspected and reviewed with check assays of Wo3 and Mo collected in January 2021, and additional check assays of Mo and Pb-Zn collected in June 2021.

# 2.4 Effective Dates

The report has the following effective dates:

• Effective Date of the Mineral Resource estimate: July 26, 2021.

# 2.5 Information Sources

Information sources used in compiling this Report are included in Section 27.

# 2.6 Previous Technical Reports

The most recent technical report on the Project was filed on behalf of Margaux Resources Ltd. In 2015, entitled: *Giroux, G., 2015, Grunenberg, P. and Park, V. "Technical Report for the Tungsten Resource Update of the Jersey-Emerald Property, Salmo, BC".* 

Previous report on the Project includes resource estimate for the Invincible, Dodger, and East Dodger zones, which were estimated in 2006 (Giroux and Grunenberg, 2006); and the Emerald, and East Emerald, which were estimated in 2009 (Giroux and Grunenberg, 2009).





# **3.0** Reliance on Other Experts

The QP author of this Report states that they are qualified persons for those areas as identified in the "Certificate of Qualified Person" for each QP, as included in this Report. The QPs have relied and believe there is a reasonable basis for this reliance, upon the following other expert reports, which provided information regarding sections of this Report as noted below. All references are summarized in Section 27 of this Report.

# 3.1 Mineral Tenure

The QP has not reviewed the mineral tenure, nor independently verified the legal status, ownership of the Project area or underlying property agreements. The QP has fully relied upon, and disclaims responsibility for, information supplied by Apex for Chapter 4 of this Report. This information was provided by Apex in August 2021, from their corporate files (Apex, 2021) and from the BC Mineral Titles Online Website in July 2021.





# 4.0 Property Description and Location

# 4.1 Introduction

The property consists of 120 mineral claims over 16,935.56ha, and 44 crown grants over 660.56ha as shown in Figure 4-1 illustrating the claims boundaries. The claims and crown grants are listed in Appendix A. The claims are in good standing until January 2024 or after. Crown grants require annual tax payments. While most claims occur on Crown lands, several property owners have surface rights.

The central claims area around the Jersey and Emerald mines are considered brownfields, and contain open mining cuts, underground mine access portals, waste dumps, and tailings impoundments.







Figure 4-1 Mineral Claims and Crown Grant Boundaries (Source: MMTS, 2021)





# 4.2 Property and Mineral Title in British Columbia

Prior to 1 June 1991, recordation in respect of a mineral claim or mining lease in British Columbia were manually recorded on, or attached to, the original application document for a mineral claim or the original lease document for a mining lease. From June 1991 to 11 January 2005, all records were entered into a computer database, maintained by the Gold Commissioner's Office. On 12 January 2005, the British Columbia mineral titles system was converted to an online registry system, MTO, and ground-staking of claims was eliminated in favour of map-staking based on grid cells.

Claims recorded prior to 12 January 2005 are referred to as legacy claims; Claims acquired through map staking are referred to as cell claims. From and after the date of changeover to map-staking, claim holders could convert legacy claims to cell claims, or maintain the original legacy claim. Legacy claims vary in size and shape, depending on the regulations that were in force at the time of staking and recordation. Cell claims comprise from 1 to 100 cells which range from 21ha in southern British Columbia to 16ha in the north.

Mineral title may also be held as part of Crown grants or freehold tenure issued under separate grant, such as a railway grant. Crown-granted mineral rights originate from staked mineral claims that were surveyed then granted from the Crown to private individuals or corporations under the legislation in effect at the time of grant.

There can be instances where there may be more than one type of mineral tenure in existence over the same land area; examples are where a Crown-granted mineral title is overlapped by a mineral tenure granted under the Mineral Tenure Act (British Columbia) (the MTA). In this case, the holder of the MTA mineral tenure is entitled only to those minerals not covered in the Crown-granted mineral title.

To keep claims in good standing in accordance with the MTA, a minimum value of work or cash-inlieu is required annually. The minimum value of work required maintaining a legacy or cell mineral claim for one year is currently set at \$5 per hectare for the first and second anniversary years, \$10 per hectare for the third and fourth anniversary years, \$15 per hectare in the fifth and sixth anniversary years and \$20 per hectare for each subsequent anniversary year. The cash-in-lieu required to maintain a mineral claim for an anniversary year is double the value of the work commitment requirement.

The holder of a mineral claim or mining lease issued under the MTA does not have exclusive possession of the surface or exclusive right to use the surface of the land. However, the holder of such claims and leases does have the right to access the lands for the purpose of exploring for minerals and to use the surface for mining activities (exploration, development, and production).

The surface of a mineral claim or mining lease may either be privately owned or owned by the Crown.

The MTA provides for a recorded claim holder to use, enter, and occupy the surface of a claim for the exploration and development or production of minerals, including the treatment of ore and concentrates, and all operations related to the exploration and development or production of





minerals and the business of mining, subject to production limits. Permits are required before undertaking most exploration or mining activity.

A mining lease is required if the claim holder wishes to produce more than 1,000 tonnes of ore in a year from each unit in a legacy claim (typically 25ha) or each cell in a cell claim. The holder of a mineral claim may obtain a mining lease for that claim if certain requirements are met (surveying if required, payment of fees, and posting of notices). A mining lease allows the lessee to hold Crown mineral lands for up to 30 years initially and is renewable if certain conditions are met. A recorded claim holder must give surface owners of private land and leaseholders of Crown land notice before entering for any mining activity. A recorded holder is liable to compensate the surface owner for loss or damage caused by the entry, occupation or use of the area for exploration and development or production of minerals.

#### 4.3 Project Ownership

The Jersey-Emerald Project is currently owned 100% by Apex Resources, Inc.

There are six underlying NSR royalty options resulting from purchase of neighboring claims resulting in the project as it exists today. These purchases and royalties are described below. The net NSR royalty and buydown options are summarized in Figure 4-2.







Figure 4-2 NSR Royalty Agreements (Source: MMTS 2021)





# 4.3.1 Bourdon, Addie Agreement July 1993

The original Jersey property comprised of 28 crown granted claims, 80 mineral units and 4 two post claims is subject to the following royalties:

- (a) 1.5% Net Smelter Returns ("NSR") royalty to the Optionors, Addie and Bourdon. Apex has the right to purchase 50% of the NSR for 50,000 shares of Sultan Minerals Inc. on completion of a positive feasibility report. This royalty applies to a two kilometer Area Of Interest from the original outside boundaries of the Property (encompasses mineral tenure numbers: 318816, 318817, 319025, 319026, 322324-322329, 322859-322862, 325259-325262, 325269, 325270, 330364-330367, 342202, 342203, 348168-348170, 518176, 550768 and 550769 and Crown Grant Lot Numbers: 14882, 14890, 14763, 14761, 14762, 14904, 12083, 9073, 9074, 9071, 15020, 15021, 14881, 9070, 3368, 3369, 12116, 12117, 9075, 12087, 14889, 12115, 14765, 14764, 9072, 9076, 15033, 14888, 12688, 15041, 15040, 1070, 1071, 14766 and 15091-15099). Annual advance royalty payments of \$50,000 commence in 2013.
- (b) 1.5% Net Smelter Returns ("NSR") underlying royalty on the 28 crown granted claims to Nu-Dawn Resources Ltd (encompasses Crown Grant Lot Numbers: 14882, 14890, 14763, 14761, 14762, 14904, 12083, 9073, 9074, 9071, 15020, 15021, 14881, 9070, 3368, 3369, 12116, 12117, 9075, 12087, 14889, 12115, 14765, 14764, 9072, 9076, 15033 and 14888). Sultan can purchase 50% of the Nu-Dawn NSR for the sum of \$500,000.

#### 4.3.2 Emerald Gold Mines Ltd., Agreement July 1996:

Eleven mineral claims, numbers 324439, 331985, 331986, 341224, 341225, 330368, 330369, 330370, 330371, 330372 and 330373 are subject to a 1.5% Net Smelter Returns ("NSR") royalty. Apex can purchase 50% of the NSR for 25,000 shares of Apex Resources Inc. on completion of a positive feasibility report.

#### 4.3.3 Murray – Summit Gold Property Agreement September 1996:

Four mineral units and one reverted crown grant, tenure numbers 347849, 347850, 347851, 347852, and 233462 are subject to a 2.0% Net Smelter Returns ("NSR") royalty. Apex can purchase 100% of the NSR for \$500,000, at its discretion, after completion of a positive feasibility report.

#### 4.3.4 Boronowski - Invincible Claim Agreement May 2005:

The Invincible Claim, tenure number 234582, is subject only to a 2.0% Net Smelter Return royalty ("NSR"), payable to the Vendors. Apex has the right to reduce the NSR to 0.5% by making a one-time payment of \$150,000 to the Vendors after completion of a feasibility study. Annual advance royalty payments of \$3,000 commenced in 2010.

#### 4.3.5 Locke Goldsmith - Victory Tungsten Property Agreement April 24, 2009:

The six reverted crown grants, tenure numbers 233693 through 233697 and 233677 are subject to a 2.0% Net Smelter Return ("NSR") royalty. Apex has the right to reduce the NSR to 0.5% by making a one-time payment of C\$150,000.00 to the Vendor at any time up to and including the commencement of commercial production.

#### 4.3.6 Aspen Silver Mine Agreement November 2009:

The Aspen Property, tenure numbers 548440, 548464. 548465, 548466, 548467, 604689 and 665745, is subject only to a 1.0% Net Smelter Return royalty ("NSR"), payable to the Vendors. Apex has the right to reduce the NSR to 0.5% by making a one-time payment of \$100,000 to the Vendors at any time up to and including the commencement of commercial production.





# 5.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

# 5.1 Accessibility

The Jersey-Emerald property is approximately 10km southeast of the town of Salmo. Salmo is 41km south of Nelson.

From Salmo, the access to the property is south via Airport Road and east along Emerald Mine Rd. Access from the Nelson-Nelway Highway (Highway 6) is east via Bellmond Rd, between Salmo and the Crowsnest Highway (Highway 3) junction to Creston, north on Airport Rd, and east on Emerald Mine Rd.

A network of good quality gravel roads provides excellent all-season access to the centre of the property. If surface work is performed during winter, then the roads require snow removal and maintenance.

# 5.2 Climate

The property enjoys a pleasant summer climate with August temperatures averaging 25 degrees Celsius (oC) with moderate precipitation. Winter temperatures average -10oC in January with moderate snowfall. Total annual precipitation is about 750mm of moisture, with much of this falling during the rainy season from April to June and up to 1.2m of snow may fall during the winter months. Snow-free conditions at higher elevations arrive from late April to early November.

# 5.3 Local Resources and Infrastructure

Teck Resources Ltd.'s (Teck) Trail Operations, located about 40km from the property, includes a zinclead smelter and refinery, and the Waneta hydroelectric dam and transmission system. The metallurgical operations also produce a variety of precious and specialty metals.

Crew lodgings are available in Nelson or Salmo. A skilled labour force for mining and exploration is available in Nelson, Salmo, Trail, and Castlegar. Trail, Nelson, and Castlegar are major supply and service centers for resource industries. The Highway 6 corridor carries a power line and a natural gas line.

As illustrated in Figure 4-1 Jersey-Emerald claims area is extensive allowing sufficient areal extent for possible future mining operations, including potential tailings storage areas, potential waste disposal areas, heap leach pad areas, and potential processing plant sites.

# 5.4 Physiography

The property is situated in the rugged mountainous physiographic division known as the Selkirk Mountains. Near the claims, relief is about 1,200m between Salmo Creek in the valley bottom at 600m and the crest of Nevada Mountain at 1,860m. Slopes vary from rolling within the centre of the claims to moderately steep along the east and west margins. The topography provides numerous areas for development of infrastructure required for mining and milling within the claims.





Much of the area has been logged or previously burned, resulting in vegetation consisting of small diameter stands of larch, balsam, fir, jackpine, and mountain alder. In many areas, second growth vegetation is extremely dense, making movement through the forest difficult.

Several areas of extensive outcroppings occur over and immediately north of the Jersey mine site, but a veneer of glacial till covers much of the property. The till cover varies in thickness, from less than 1m on the slopes to more than 20m in valley bottoms.





# 6.0 History

# 6.1 Early Exploration

The earliest record of exploration in the area dates to 1895 when gossanous outcrops on the south side of Iron Mountain attracted the attention of prospectors. Initially, the area was explored for gold. The 1896 Minister of Mines Report states that assay results as high as about 100gpt were obtained from the area (Dandy, 1996).

In 1906, prospecting discovered lead mineralization on the Emerald claims. Several small, high-grade ore shipments were made. Iron Mountain Ltd. was formed in 1910 by Pacific Coast Steel of San Francisco to develop the property. A 25tpd mill, erected in 1919, operated until 1926 when low metal prices forced closure, and was destroyed by forest fire in 1934 (Dandy, 1996).

Tungsten and molybdenite mineralization were discovered in skarn bands at the site of the longabandoned gold workings on the Emerald, Emerald Fraction, and Gold Standard claims in 1938. The war effort put the Emerald Tungsten Mine into production under Wartime Metals Corp., a federal government agency, in 1942. In 1943, the war demand for tungsten eased and operations were suspended (Dandy, 1996).

# 6.2 Canadian Exploration Ltd.

Canadian Exploration Ltd. (Canex) purchased the properties of Iron Mountain in 1947. Tungsten production from the Emerald, Feeney, and Dodger deposits occurred between 1947 and 1949, and 1951 to 1958. In 1952, Canex purchased the government-held tungsten reserves and tungsten mill. Tungsten production from the Invincible, and East Dodger deposits occurred from 1970 until 1973, when the mine closed due to low metal prices (Dandy, 1996).

Over the mine life 1,597,802t of tungsten ore grading 0.76% Wo3 were mined and milled. Lead-zinc production from Jersey and Emerald deposits occurred between 1949 and 1970 and produced 7,968,080t of Zn-Pb ore grading 3.83% Zn and 1.95% Pb (Dandy, 1996).

# 6.3 Mentor Exploration

Mentor Exploration Ltd. (Mentor) explored the south extension of the Emerald shaft tungsten zone in 1979. The target was considered too deep and narrow to be adequately drilled from surface. In 1981, Mentor drilled five holes totalling 1,070m, to test for molybdenum mineralization in the Emerald stock area. This work, which was the deepest testing to date, provided valuable information on the nature of the intrusive; however, no economic zones of molybdenite were encountered (Giroux and Grunenberg, 2006).

# 6.4 Nu-Dawn Resources, Inc., Lloyd Addie, and Bob Bourdon

In 1990, the property was sold to Nu-Dawn Resources Incorporated, and again to Lloyd Addie and Bob Bourdon, from Nelson in 1993. Addie and Bourdon discovered free gold particles in panning the tungsten tailings. The subsequent prospecting and sampling over known tungsten zones led to the discovery of significant bedrock gold values around the Jersey and Emerald zones (Dandy, 1996)





# 6.5 Sultan Minerals Inc. (Now Apex)

In October of 1993, the property was optioned by Sultan Minerals Inc. who did an exploration program including ground and airborne geophysical surveys, prospecting, and rock chip sampling. This work led to the identification of several targets believed to have potential for gold mineralization. Sultan continued exploration programs in 1994 through 1997 and again in 2005 through 2009 (Grunenberg, 2010).

Resource estimates for tungsten were completed in 2006 (Giroux and Grunenberg, 2006) and 2008 (Grunenberg and Giroux, 2008) and for lead-zinc in 2010 (Grunenberg and Giroux, 2010). A scoping study was completed by Wadrop in 2007 (Cowrie, 1007).

# 6.6 Margaux Resources (Now Cassiar Gold Corporation)

In November 2013, Margaux Resources entered into an option agreement with Sultan Minerals. Margaux completed four programs of exploration between 2014 and 2018, expanding into untested areas and upon historic results. This exploration included diamond drilling, combined gravity, ground magnetics and ground VLG survey as well as a LiDAR survey for high accuracy topography. In October 2018, Margaux elected to terminate the option agreement with Apex, formerly Sultan Minerals, Inc.





# 7.0 Geological Setting and Mineralization

# 7.1 Regional Geology

The Jersey-Emerald Property is at the southern end of the Kootenay Arc, a narrow arcuate tectonic belt of Paleozoic miogeosynclinal and transitional rocks. It is comprised of mixed carbonates and pelites, subdivided into the Truman Member brown argillite interbedded with thin, grey, and white, locally dolomitic limestone, the Emerald black argillite and the Reeves limestone. To the east the rocks are inter-layered with clastic and minor volcanic rocks of late Proterozoic arc. The Upper Laib Formation comprises green phyllite and micaceous quartzite. To the west they are in structural contact with the Upper Paleozoic and Mesozoic eugeosynclinal argillites and volcanics (Dandy, 1996).

Granitic dykes, sills, and igneous bodies of Cretaceous age intrude the sedimentary units (Hoy and Dunne, 1997). Figure 7-1 illustrates the major lithologies of the region.

# 7.2 Local and Property Geology

The property consists of rocks of the Laib Formation of transitional rocks comprising mixed carbonates and pelites (Little, 1985). Small plugs, dykes, and sills of Cretaceous granite intrude the sedimentary rocks, resulting in re-crystallized coarse-grained marble to garnet-pyroxene skarn within the sedimentary rocks near the contacts. The Laib Formation has been deformed by three phases of folding. The dominant structure within the property is a major NNE-trending anticline known locally as the Jersey anticline (Dandy, 1996).

Potassium-argon (K-Ar) age dates obtained from biotite from the Late Jurassic Dodger stock give a date of  $100.0 \pm 3.0$  million years (Ma). One kilometer west of the Jersey mine, the Laib sediments are intruded by the Salmo River stock, a small circular body of Tertiary augite monzonite. Biotite from this stock gave a K-Ar age of  $50.6 \pm 1.5$  Ma (Giroux, et al 2015).

Two narrow, NNE-trending elongate dyke-like bodies of Cretaceous biotite granite, locally known as the Emerald and Dodger ridges, flare from the underlying intrusive into the sediments of the Jersey anticline. The majority of the mineralized bodies formed along the margins of these ridges (Giroux, et al 2015). Figure 7-2 is a map of the property geology.







Figure 7-1 Regional Geology (Source: MMTS, 2021, Geology shapes from BC digital database, 2019)







Figure 7-2 Local Property Geology (Source: MMTS, 2021, Geology shapes from BC digital database, 2019)





# 7.3 Mineralization

Mineralization on the Jersey property is associated with the east limb of a complex major anticlinal structure referred to locally as the Jersey anticline and regionally as the Salmo River anticline. Also associated with this structure are the HB lead-zinc mine located four kilometers to the north and the Reeves MacDonald lead-zinc mine located ten kilometers to the south.

Several zones of significant and often very different mineralization have been identified on the property, examples are historically mined areas which produced lead-zinc and tungsten, with known areas of high molybdenum, gold, bismuth, arsenic, copper, silver, cadmium, and barium. Work done by Apex as Sultan Minerals outlined numerous mineralized zones that are discussed below, along with the historically known mineralized zones (Dandy, 1996). The location of historic workings and deposit shapes modeled in this resource estimate are given in Figure 7-3.

#### 7.3.1 Tungsten Zones

#### 7.3.1.1 Emerald Tungsten Deposit

The Emerald tungsten deposit occurs along the contact between the Reeves limestone member and the Emerald argillite member, located along the west side of the Emerald stock. Within the deposit four distinct types of mineralization are recognized: skarn, sulphide, greisen, and quartz. The skarn-type of mineralization occurs mainly along or near the limestone argillite contact. It consists of garnet, diopside, calcite and quartz with lesser amounts of pyrrhotite, pyrite, scheelite and molybdenite. The sulphide-type consists of pyrrhotite, calcite, biotite and scheelite, is often spatially associated with the skarn mineralization, and consists of irregularly shaped "replacement" bodies in limestone and dolomite. Locally quartz, pyrite, molybdenite and chalcopyrite may be present.

This greisen-type of deposit occurs in altered granite and extends up to 12m into the granite from the limestone contact. It includes potash feldspar - in some places completely kaolinized, abundant quartz, sericite, pyrite, tourmaline and scheelite. Locally, calcite, ankerite, apatite, pyrrhotite or molybdenite may be present. The quartz-type of deposit in many places grades into greisen. It consists of silicified limestone cut by numerous veins of quartz with ankerite, scheelite, minor molybdenite and apatite. The veins are enveloped by disseminated mineralization comprised of scheelite, pyrite, pyrrhotite and tremolite.

Scheelite is the main tungsten mineral but minor powellite and wolframite have also been recovered. Most of the scheelite mineral was recovered from lenticular skarn zones developed along the contact between the Emerald argillite and the Reeves limestone.

The Emerald tungsten zone was mined intermittently from 1943 to 1973. Grades ranged from 0.5 to 1.5% Wo3 and averaged 0.86% Wo3 for the entire 1,076,799 tonnes of production (Dandy, 1996).







Figure 7-3 Emerald-Jersey Property Deposit Locations





# 7.3.1.2 East Emerald Tungsten Deposit

The East Emerald deposit is located east of the Emerald deposit. It has never been exploited. Historic drilling indicated tungsten-skarn mineralization adjacent to or distal from the granitic contact, similar to that historically mined from the Dodger deposit to the east. In 2006, Sultan drilled four holes to verify the historic mineralization. In 2104, Margaux drilled 35 holes that were successful in helping to define persistent tungsten mineralization striking NNE for 1,300m.

Mineralization occurs in a sequence of parallel skarn bands that dip moderately to the east. The bands range in thickness from one to 20m, with most averaging between 5 and 10m. Up to 10 bands may occurs on a drill section; however, their occurrence is best identified in areas with less sparse drilling. The interpretation suggests that these bands will ultimately terminate in the underlying granite.

Skarnification of argillite or limestone creates mm- to decimeter (dm)-scale garnet-diopside bands. Tungsten occurs as stratabound flecks to dense concentrations of scheelite. Pyrrhotite and lesser pyrite are common accessory sulphides. Assays returned Wo3 results up to 2.47%; however, most values were between 0.10 and 0.30% Wo3 (Giroux et al, 2015).

# 7.3.1.3 Dodger Tungsten Deposit

Near the Jersey Lead-Zinc Mine, skarn-type tungsten mineralization occurs where the Cretaceous intrusions are in contact with either of the calcareous Truman or Reeves members. Tungsten was mined from two distinct zones on the property: The Dodger zone located along the east side of the Jersey lead-zinc deposit; and the Emerald zone comprised of the Emerald, Feeney and Invincible deposits located along the west side of the lead-zinc deposit.

The Dodger tungsten skarn deposit is comprised of three zones with finely disseminated scheelite grains in light brown to green garnet-diopside skarn. The conformable deposit occurs in a skarnified limestone unit near the top of the Truman Member. The mineralized zones are separated by a tongue of granite believed to be an appendage of the Dodger Stock. In this deposit, scheelite is accompanied by pyrrhotite, biotite, quartz, molybdenite and minor powellite. The mineralized zones range from 2.0 to 9.0 meters in width and average 3.0 meters.

The Dodger tungsten zone was mined intermittently from 1951 to 1973 and averaged 0.56% Wo3 for 521,023 tonnes of production (Dandy, 1996).

#### 7.3.1.4 Dodger "D" Deposit

The Dodger "D" Deposit is represented by a series of pits and trenches located along the contact of the Dodger Stock and skarnified Truman Member argillites. This zone is located about 300m southwest of the Dodger 4400 Adit.

Near the workings, the Dodger Stock is pegmatitic, consisting entirely of white quartz and feldspar phenocrysts up to 15cm diameter. The workings are located within very rusty, skarn banded Truman Member sediments. Visible mineralization consists of massive to disseminated and banded pyrrhotite, pyrite, bismuth, molybdenite, and chalcopyrite, with assays also indicating the presence of gold, zinc, and tungsten (Dandy, 1996).





### 7.3.1.5 Invincible Tungsten Deposit

The Invincible Tungsten Deposit is adjacent to the western margin of the Late Jurassic Dodger stock where it transects flat-lying beds of the Reeves Member limestone of the Lower Cambrian Laib Formation. The deposit lies 1,500 meters northeast and along strike, but on the east side of the Emerald granite stock from the Emerald tungsten deposit.

The deposit is bounded above and below by skarn and argillite of the Truman and Emerald members of the Laib Formation respectively. Most of the scheelite occurs in lenticular zones that extend at a high angle from the granitic stock, more or less conformable with layering of the host rocks. The scheelite occurs as fine, disseminated grains within garnet-diopside skarn and is accompanied by pyrite, pyrrhotite, minor powellite and traces of molybdenite and wolframite. Quartz is common in zones of mineralized granite.

The mineralized zone extends up to 24m from the stock and may be more than 3m thick in places. The zone lies about 260m below surface and produced 256,480 tonnes of 0.65% Wo3 from 1970 to 1973 (Geology, Exploration and Mining in British Columbia 1973, pages 54-57). The northern extension of the Invincible mine remains incompletely tested (Giroux et al 2015).

#### 7.3.1.6 Feeney Tungsten Deposit

The Feeney tungsten deposit is located on the east side of the Emerald granitic stock along strike to the north of the Emerald mine and south of the Invincible mine. The zone forms a relatively shallow ore body within the Lower Cambrian Laib Formation along the granite-limestone contact between the Reeves Member limestone and Emerald Member argillite.

The mineralization consists of scheelite with minor powellite, rare wolframite and traces of molybdenite in a green and brown garnet-diopside skarn containing augite, actinolite, epidote, pyrrhotite and quartz. Most of the scheelite occurs as fine, disseminated grains in lenticular skarn zones which extend from the granite contact out into the limestone-argillite country rock conformable to bedding. The skarn zones are up to 6 meters long and average about 2m in width. Grades are about 0.5 to 1.5% tungsten. The Feeney mine operated between 1951 and 1955 and produced about 54,000 tonnes of ore averaging 0.92% Wo3 (Giroux et al, 2015).

#### 7.3.2 Gold Zones

#### 7.3.2.1 Bismuth Gold Zone

The Bismuth Gold zone (known in the underground workings as part of the F zone) is located along the east side of the Jersey lead-zinc deposit at the contact between the Reeves limestone and the underlying Reeves dolomite. Gold mineralization was initially recognized here in 1963 when Placer Dome obtained 3.4g/t gold from four samples assayed from an extensive native bismuth and arsenopyrite bearing zone. The zone was intersected while exploring the Jersey lead-zinc deposit and the underlying East Dodger tungsten zone. The zone was rediscovered in 1993 by the Apex as Sultan while inspecting Placer Dome drill logs. The gold mineralization, believed to be skarn-related, occurs in a silicified horizon with pyrite, pyrrhotite, arsenopyrite, stibnite and native bismuth. Underground samples assay up to 8.0g/t gold across widths of 96.0 centimeters (Dandy, 1996).





# 7.3.2.2 #1 Zone

The #1 zone, represented by a 300m long series of trenches and small to large pits, is located along the contact of the Reeves limestone and the Emerald argillite where they trend south from the Emerald Tungsten open pit mine. In the workings, rusty-banded sulphide mineralization occurs with iron oxides (limonite and goethite) and coarsely recrystallized limestone. Sulphide mineralization occurs as massive Po bands, which return high values for As, Cu, and Zn, with minor Au, Ag, and Mo (Giroux, et al 2015).

#### 7.3.2.3 Emerald Gold Zone

The Emerald gold zone was first recognized in 1895 and may be coincident with the Emerald tungsten zone. The zone was prospected for gold from 1895 to 1906 and assays up to 100g/t were reported. After the lead-zinc potential of the property was recognized in 1906 and later with the discovery of the tungsten mineralization over this area the gold potential of this zone was not explored. The zone was rediscovered in 1993 when Apex as Sultan found that free gold could be panned from the tungsten tailings. Gold mineralization has been found to be associated with the quartz and pyrrhotite rich sections of the skarn and sulphide-type tungsten zone.

The Emerald gold zone occurs along the contact with the Reeves limestone and Emerald argillite, and trends from the Emerald Tungsten deposit towards the #1 Zone. These three areas may represent mineral zonation grading away from the Emerald Stock (Giroux and Grunenberg, 2006).

#### 7.3.2.4 Leroy Gold Zone

The Leroy gold zone is located approximately one kilometer north of the Emerald gold and tungsten zones. Gold mineralization was discovered here in the late 1890's and the zone was explored with a series of pits, adits, and hand trenches along an 800-meter strike length. Gold exploration ceased with the discovery of lead-zinc in 1906.

Over the Leroy zone gold mineralization is associated with pyrrhotite, pyrite and native bismuth in a silicified horizon at the contact between the Reeves limestone member and the Emerald argillite member. Grab samples of this zone gave gold grades up to 0.898oz/t (25.5g/t) from and up to 0.174oz/t (4.8g/t) across a true width of 3m for chip samples (Giroux and Grunenberg, 2006).

#### 7.3.2.5 ABC Zone

The ABC zone occurs just to the east of the Jersey and Dodger underground workings along the Iron Mountain Fault. This major fault structure represents the contact of the Ordovician Active Formation argillites with the Cambrian Reeves Member limestones.

Anomalous samples were collected from slices of pyritic garnet-diopside skarn bands entirely within Active Formation argillite, but adjacent to the Reeves limestones. Rusty, limonitic, decomposed argillite(?) with minor quartz stockworking is found on the west side of the skarn banding. Sulphide mineralization is confined to pyrite within the skarn bands, with limonite occurring adjacent to this unit. Assays indicate the presence of high arsenic and minor gold, molybdenum, and lead values (Giroux and Grunenberg, 2006).

#### 7.3.3 Molybdenum Zones

Molybdenum mineralization was noted in several areas within the historic Jersey, Dodger, Invincible, Emerald, and Feeney mine workings. Follow-up work during the 2000 to 2005 field seasons indicated





that the most readily accessible area for molybdenum exploration is within the 4200 level of the Dodger mine workings, which were in good condition where access drifts were completed during the historic tungsten mining. Mapping of the drifts indicated that the granitic rock that underlies the Dodger-type skarn tungsten mineralization contains porphyry-style quartz veining with molybdenite mineralization.

Exploration of the porphyry system, along the margin of the historic Dodger East Tungsten zone, revealed a stockwork of quartz veining and fractures with molybdenite. The cross-cutting fractures and quartz veins are oriented north-south and east-west, with steep dips. Several high-grade molybdenite zones were intersected, including 1% to 3% Mo over short widths of 90cm to 1.5m. Twenty holes drilled during 2005 indicated the potential for larger volumes of lower- grade molybdenum that includes short sections of higher-grade material (Giroux, et al 2015).

#### 7.3.4 Lead Zinc Zones

#### 7.3.4.1 Jersey Lead-Zinc Deposit

The Jersey lead-zinc deposit occurs in dolomite near the base of the Reeves limestone member. Five ore bands, ranging in thickness from 0.3 to 9.0 meters have been mined historically. These bands in order of stratigraphic sequence are: 1) upper lead band; 2) upper zinc band; 3) middle zinc band; 4) lower zinc band; 5) lower lead band. The five ore bands are locally very close together and in the A Zone frequently have been mined as a unit up to 24 meters thick. Ore mineralization consists of fine-grained sphalerite and galena with pyrite, pyrrhotite and minor arsenopyrite. Cadmium is associated with the sphalerite and silver with galena. Iron content of the sphalerite is low, about 6%. The overall grade for the 7,968,080 tonnes milled through 1970 averaged 3.83% zinc and 1.95% lead (Dandy, 1996).

#### 7.3.4.2 Emerald Lead-Zinc Deposit

The Emerald lead-zinc deposit is located immediately to the north of the Jersey lead-zinc deposit, along the same host structure. Mineralization in the Emerald lead-zinc mine consists of banded limestone and dolomite of the Reeves Member hosting stratabound lead and zinc bands (Dandy, 1996).




## 8.0 Deposit Types

There are several deposit types of varying mineralization styles, in the Jersey-Emerald Project area as described below.

## 8.1 Lead-Zinc Deposit

The Pb-Zn deposits form stratiform, tabular, and lens-shaped concentrations of pyrite, sphalerite, and galena in dolomitized zones. Brecciated zones are common within the more massive sulphide mineralization. Age dating indicates that the Zn-Pb deposition is of Ordovician to Devonian age, which suggests that the deposits may be classified as Mississippi Valley Type, emplaced during rifting along the continental margin with increased igneous activity along the deposition belt. They are hosted by fine-grained, poorly layered to massive dolomite of the Reeves Member (Simandl and Paradis, 2009).

The Pb-Zn mineralization occurs near the base of the Reeves Member and varies in thickness from 8 to 30m. The Truman Member forms the footwall rocks. Five dolomite-hosted bands of Pb-Zn occur within the mine. Sulphide mineralization consists of fine-grained sphalerite and galena, with pyrite, pyrrhotite, and minor arsenopyrite (Giroux et al, 2015)

The dolomites are texturally distinct from the medium-grained well-banded grey and white Reeves limestone. The deposits, their dolomitic envelopes, and the limestone host rock generally lie within secondary isoclinal folds along the limbs of regional anticlinal structures. They form stratiform, tabular, and lens-shaped concentrations of pyrite, sphalerite, and galena in dolomitized zones. (Giroux et al, 2015).

## 8.2 Tungsten Deposits

Tungsten mineralization occurs in two distinct environments: skarn-style mineralization at granite limestone contacts, and strata bound disseminated mineralization in favourable zones within the Truman Member (Giroux and Grunenberg, 2006).

## 8.3 Gold Mineralization

Gold occurs in areas that were historically mined for tungsten. Work by Apex as Sultan indicated that the gold is skarn-related, occurring in silicified horizons with pyrite, pyrrhotite, arsenopyrite, stibnite, and native bismuth (Giroux and Grunenberg, 2006).

## 8.4 Porphyry Style Deposits

Exploration and development of Zn-Pb and tungsten deposits on the property, quartz stockwork and alteration zones have suggested the potential for gold mineralization within the granites underlying the previously mined areas. Mapping of underground headings, and sampling of drill core during mining operations, indicated the presence of molybdenite within these porphyry-style veined zones (Giroux and Grunenberg, 2006).





## 9.0 Exploration

Exploration by owners prior to Sultan Minerals is discussed in the Section 6.0 History. Exploration done by Apex as Sultan Minerals is credited to Sultan in this Section. Apex has not done any exploration work after the work completed by Margaux.

## 9.1 Sultan Minerals

During the winter of 1994-95 Sultan undertook an eleven-hole (1,324m) diamond drill to follow up targets identified by previous work. The discovery of several gold bearing zones in the vicinity of both the Jersey Lead-Zinc Deposit and the Emerald Tungsten Deposit was a result of the drilling. The drilling also identified a lead-zinc zone situated 55m below the former Jersey Lead-Zinc Deposit. (Dandy, 1996).

An airborne magnetic survey conducted in 1993 covered the historic mine areas and periphery. Contours of total field intensity from this survey are given in Figure 9-1 (Grunenberg, 2009).

In 1996, an exploration program consisting of soil and silt sampling, geological mapping, prospecting, rock sampling and diamond drilling was carried out on the property to better delineate the mineralized areas identified by Sultan. A total of three underground and thirteen surface diamond drillholes were completed for a total of 1,707 meters. Drilling was designed to test the gold potential of the Bismuth-Gold zone, Emerald Gold zone, Leroy Gold zone and the lower lead-zinc horizon. Three drillholes were completed to the east of the mine area to test an anomalous multi-element geochemical zone delineated from surface exploration, called the East Ridge zone (Giroux and Grunenberg, 2006).

Exploration on the claims was inactive until dramatic increases in market values for molybdenum occurred in 2005. Sultan Minerals conducted exploration for molybdenum targeting the Dodger Mine area where historic records indicated the presence of molybdenite. An assessment of the potential tungsten resources was undertaken and target areas surrounding the Dodger Tungsten, and Emerald and Invincible Tungsten historic mines were delineated (Giroux and Grunenberg, 2006).

In 2006, exploration on the property continued to expand the molybdenum mineralization in the Dodger Mine area with eight diamond drillholes. Drilling in 2007 included 19 underground holes primarily in the molybdenum mineralization in the East Dodger zone, and 61 surface holes distributed over the property to test for lead-zinc, molybdenum, and tungsten mineralization (Giroux and Grunenberg, 2006).

Exploration in 2008 included fourteen diamond drillholes over the Emerald and East Emerald target areas and a single drillhole on the Invincible claim. A heliborne magnetic and electromagnetic survey was conducted by Fugro Airborne Surveys and analyzed by Walcott and Associates in late 2008 to early 2009. The survey was part of a large 4,367-line kilometer survey via a partnership of Natural Resources Canada and Geoscience BC to gather geophysical and geological data over the Kootenay Arc. The larger survey was flown on line 200m apart, and additional infill lines were flown over the Jersey property with 100m spacing. The Fugro Survey did not contribute significantly to furthering exploration potential on the property beyond the 1993 survey as the size of the equipment and terrain necessitated flying height greater than planned (Grunenberg, 2009).





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Figure 9-1 1993 Airborne Magnetic Survey Contours of Field Intensity (Source: Grunenberg, 2009)





In 2009, an additional fourteen diamond drillholes are reported in peripheral areas including the Nevada Mountain area, Lost Creek corridor, north of the Invincible tungsten mine and on the Victory tungsten property. Magnetometer surveys were also conducted over four areas of the claims and additional soils sample surveys were conducted (Grunenberg, 2010). All 2009 exploration was outside of the current resource areas.

## 9.2 Margaux Resources

In 2014 drilling by Margaux was conducted in two phases in the East Emerald area which confirmed and expanded upon historic results. The drilling consisted of 35 holes, totalling 6,319m (Park and Grunenberg 2015).

In 2016 a total of 882m in six holes were drilled to the north of the historic lead-zinc mine with the primary intent to follow up on a high-grade gold intercept from 2014. A geophysical survey was initiated in December 2016 with the objective to cover VLF, ground magnetics, gravity, DCIP and TDEM surveys over nine lines of 2.5km spaced at approximately 500m. Due to difficult field conditions only 82% of the gravity, and 63% of the magnetics and VLF work was completed. A map showing survey coverage is given in Figure 9-2. A LiDAR survey was flown over the property in October 2016 by Orthoshop Geomatics to provide more accurate topography for 3D modeling and drilling planning. The LiDAR survey also resulted in high quality mosaic orthophoto as shown in Figure 9-3 with claims and topographic contouring (Caron, 2017a).

In 2017 exploration was limited to drilling for a total of 1,115m in six holes, to test gold and lead-zinc targets (Caron, 2017b). Again in 2018, exploration was limited to drilling, this time testing for gold mineralization associated with EM conductors west of the historic mine areas and resulted in consistently low gold values in these holes (Caron, 2018). No additional exploration work has been done since the Margaux terminated the option agreement in 2018.







Figure 9-2

2016 Geophysical Survey Coverage (Source: Caron, 2017)











# 10.0 Drilling

A summary of drilling in all areas of the Jersey-Emerald Project included in the Jersey database is given in Table 10-1 which summarizes total number of drillholes and total drillhole length. A map of drilling by operator is shown in Figure 10-1.

			By DH Typ	be		Total	
Operator	Year	# of holes - DDH and unknown	Length (m)	# DDH	Length (m)	# Holes	Length (m)
Various	Historic	4,883	159,856			4,883	159,856
	1994			7	887		
	1995			2	215		
	1996			8	533		
	1997			8	933		
Sultan	2005			20	2,092		
Minerals	2006			8	1,016		
	2007			80	13,031		
	2008			26	5,285		
	2009			14	1422.8		
	sub-Total Sultan			173	25,414	173	25,414
	2014			35	6,319		
	2016			6	882		
Iviargaux	2017			6	1,115		
Resources	2018			6	1,139		
	sub-Total Margaux			53	9,455	53	9,455
Total		4,883	159,856	226	34,870	5,109	194,726

Table 10 1	Summary of Drill	ing _ All Arooc w	lithin the Droject
	Summary of Drift	ilig – All Aleas w	num the Project







Figure 10-1 Map of all Drillhole Locations by Era Drilled (Source: MMTS, 2021)





## 10.1 1994-1997 Drilling by Sultan

Drilling in 1994-1995 focused on the Jersey Lead-Zinc Deposit and the Emerald Tungsten Deposit. Significant intersections included a lead-zinc zone 55m below the formerly described lead-zinc deposit (Giroux, 2006).

In 1996, underground and surface holes were completed to test the gold potential of the Bismuth/Emerald Gold zone and the lower lead-zinc horizon. Gold mineralization was intersected in three underground drillholes and two surface holes. (Dandy, 1997).

### 10.2 2005-2008 Drilling by Sultan

All core drilled by Sultan was NQ sized. The 2005-2006 drilling was primarily underground in the Dodger 4200 zone in the East Dodger deposit (Giroux, 2006). Significant molybdenum mineralization was intersected with variable grade, the highest in areas with higher fracture and greater vein density. Significant results include drillhole JM05-02 with 0.13% Mo over the entire 58.5m. Assays as high as 3% Mo over a 1.1m interval is also observed.

The 2007 drilling was in the East Emerald and East Dodger deposits (Grunenberg, 2008). Significant tungsten results are reported in holes JS07-22 and JS07-24 with assays up to 4,450ppm. Additional significant tungsten assays are observed in intervals greater than 1m in holes JS07-38 of 10,380ppm, JS07-25 of 17,400ppm and JS07-39 of 10,560ppm. Significant results for tungsten from Drillhole ES08-03 up to 2,340ppm, are also reported from drilling in the East Emerald deposit (Grunenberg, 2009).

### 10.3 2014 - 2017 Drilling by Margaux

Drilling in the East Emerald deposit in 2014 was spaced approximately 40-100m apart over 825m on existing trails. One to three drillholes were collared at each pad with varying orientations. Drillholes were marked with flagged wooden posts with metal identification tags. Collar locations were determined by a handheld GPS (Giroux et al., 2015).

Significant intercepts include 0.49% Wo3 over 2.75m in hole E1402, 0.59% Wo3 over 2.75m in hole E1404 and 24.98g/t Au over 10.2m in hole E1411. The drilling program identified additional tungsten mineralization described as mostly persistent parallel skarn bands in argillite or limestone beds that dip moderately to the east.

The driller in 2016 was Full Force Diamond Drilling of Kelowna, BC and all core was NQ sized (Caron, 2017a). No new roads were built to access the drill pads, and all collar locations are reported to be marked with posts and metal tags. The collars were not surveyed at the time, this was planned to follow the 2017 drill program. Drill collars were reported by handheld GPS.

Three holes were planned to follow the high-grade gold found in 2014. Hole E1601 encountered one interval of 6m averaging 0.77g/t, and one interval of 7.9m averaging 0.62g/t. Hole E1602 intersected two narrow, 0.25m, intervals with gold grades of 9.79g/t and 59.1g/t.

Details of the 2017 drilling program are given in the assessment report by Caron (Caron, 2017b). The drilling contractor was Critchlow Enterprises of Salmo, BC and all core was NQ2 sized. No new roads





were built to access the drill pads and all collar locations are reported to be marked with posts and metal tags. Surveyed had not been done at the time of report publishing but was reported to be planned. Drill collars were determined by handheld GPS.

Significant intervals identified in the Margaux drilling include a broad interval of elevated gold (16.1m at 0.16g/t Au) in hole JE17-02.





## **11.0** Sample Preparation, Analyses and Security

## 11.1 Sample Preparation and Analyses

## 11.1.1 Historic Sampling

There is no documentation available to MMTS on sampling and analysis methods for intervals from drillholes intersecting the resource areas before 2005. Sampling and analysis were conducted on drilling by Sultan on the Jersey – Emerald Property in years 1994 through 1997 and is documented, however, none of these holes are in the deposit shapes.

## 11.1.2 2005 and 2006 Sultan Sampling and Analysis

In 2005, all drill core was removed from site at the end of each shift and logged at a secure facility in Salmo, B.C. The core was split with a manual core splitter, and in some cases with a diamond saw. Half the core was placed in a sample bag labeled with an assay tag number and the other half was returned to the core box and marked with the same assay tag number. Samples intervals of approximately 1m were selected based on lithology, structure, and mineralization (Grunenberg and Giroux, 2006).

Samples were prepared and assayed by Acme Labs in Vancouver, B.C, accredited to ISO9001:2000 at the time. QAQC samples were not inserted by Sultan. Acme employed an internal system of standards and duplicates for QAQC upon which Sultan relied. Preparation at the lab included crushing and pulverizing to 95% passing 150 mesh. Analysis was by aqua regia and ICP-ES or ICP-MS. Additional samples when elevated levels were observed were processed by phosphoric acid leach and ICP-ES for tungsten, fire assay and ICP-ES for gold and 4-acid or again with aqua regia and ICP-ES for molybdenum. Certificates indicate the same sample preparation and analyses was done for samples obtained in 2006.

## 11.1.3 2007 Sultan Sampling and Analysis

Sampling procedures are described as the same as the 2005 program above. Two laboratories were used as primary labs, both Acme Laboratory and Assayers Canada, in Vancouver BC. Grunenberg reports that both labs were registered with ISO 9001:2000 at the time. No QAQC samples were included in the submittals by Sultan, they relied upon the internal laboratory controls (Grunenberg, 2008).

At Acme, samples were prepared by crushing, splitting, and pulverizing to 95% passing -150 mesh and analyzed for multi element analysis by aqua regia digestion followed by ICP-MS. Over grade tungsten was analyzed using phosphoric acid digestion and ICP-ES.

At Assayers Canada samples are analyzed by ICP-MS after 4-acid digestion. The certificates do not contain details on sample preparation. Certificates are provided with gold assays in units of ppb and the method of geochemical analysis is not specified.

## 11.1.4 2008 Sultan Sampling and Analysis

The preparation of a report on the 2008 drilling by Sultan is mentioned in Grunenberg and Giroux, 2010, but a filed assessment report on the26 total ES08xx and JM08xx series drillholes is not found. Certificates from 2008 assays show the primary assay lab was Assayers Canada. The method of





sample preparation is not specified. Multi element analysis is reported as 4-acid digestion with ICP-MS. Certificates are provided with gold assays in units of ppb and the method of geochemical analysis is not specified.

## 11.1.5 2014 Margaux Sampling and Analysis

Core was sampled along selected intervals within lithological, alteration and mineralization boundaries. Drill core was split with a manual splitter, half was placed in labeled bag with sample tag and half was stored in the core box with sample tag and marked intervals. Standards, blanks, and field duplicates were inserted and recorded. Blanks were reported to be whole or crushed material from a local facing stone supplier (Park and Grunenberg, 2015).

Samples were analyzed either at Acme Labs in Vancouver, BC (now Bureau Veritas) or ALS Global with preparation in Kamloops, BC and analysis in Vancouver, BC. Both labs are independent of Margaux. Acme Labs was reported to be in compliance with ISO/IEC 17025 at the time. The certification status of the ALS lab at the time was not specifically stated, but it is reported that there was an internal system of quality control (Park and Grunenberg, 2015).

At Acme labs the samples were crushed, split, and pulverized to -200 mesh. Aqua regia digestion with ICP-MS analysis was performed for 37 elements, and over grade tungsten was analyzed by phosphoric acid leach with ICP-ES finish.

At ALS, samples were crushed to 70% less than 2mm, split and pulverized to 85% less than 75µm. Aqua regia digestion was followed with ICP-MS for 51 elements.

### 11.1.6 2016 Margaux Sampling and Analysis

The core was transported to the core shack facility, logged for geological and geotechnical information and marked for sampling. Sample tags were stapled into the core boxes at the end of each sample interval as determined by mineralization and geology, ranging from 0.25 to 1.0m. All core was photographed prior to sampling (Caron, 2017a).

Standards, duplicates, and blanks were inserted by Margaux and identified on drill logs. Standards were purchased from Analytical Solutions. Blanks were samples of unaltered basalt purchased from Kettle Valley Stone in Kelowna, BC.

Select sampling was done and selected intervals were sawn in half and one half again into quarters, with quarter core submitted for analysis and the rest retained for reference. For field duplicate samples, the other quarter core sample was submitted as a duplicate.

A total of 468 drill core samples were delivered to the ALS Minerals Kamloops lab for preparation where they were weighed, dried, and crushed to 70% passing 2mm before splitting and pulverizing to 85% passing 75µm. Pulp samples were transported to the ALS North Vancouver lab for processing using 30g samples by fire assay with atomic absorption finish for gold and 4-acid digestion followed by ICP-MS for 48 elements.





## 11.1.7 2017 Margaux Sampling and Analysis

Core was logged for geology and geotechnical information and marked for sampling with tags stapled into core boxes at the start of each interval. Sample intervals ranged from 0.5 to 2.0m and determined by geology and mineralization. All core was photographed prior to splitting. Selected intervals were sawn in half with half submitted for sampling and half retained for reference. All core was stored on racks at the core shack facility (Caron, 2017b).

Samples of standard materials were purchased from CDN Resource Labs of Delta B.C. and consisted of gold or lead-zinc standards. Blanks consisted of locally sourced quartzite. Drill core samples and the company inserted QAQC samples were shipped to the ActLabs facility in Kamloops, B.C. for preparation and analysis. At ActLabs, samples were crushed to 80% passing 2mm and split with a 250g sample pulverized to 95% passing 105µm. Gold was analyzed by 30g samples by fire assay with AA finish, multi-element analysis was done by aqua regia digestion and ICP-MS. Overlimit samples of Pb and Zn were done with peroxide fusion.

## 11.2 Security

In 2005 to 2007 drilling by Sultan, samples for assaying were under the control of Sultan Minerals contractors from the time of collection until they were delivered to the trucking company for shipment directly to laboratories in Vancouver, B.C. (Grunenberg and Giroux, 2006, Grunenberg, 2007).

During Margaux drilling from 2014 to 2017, all core logging, splitting, and sampling activity was conducted in a secure core facility on the property, with access reportedly restricted to Margaux personnel. Core samples were sealed in rice bags with numbered plastic locking tags after preparation for shipment. Margaux personnel recorded the contents of the bags and delivered the shipments to the Westcore yard in Salmo, BC. The freight shipper, Overland West Freight Lines, delivered the samples directly to the lab facilities in Vancouver or Kamloops. On occasion, Margaux personnel delivered the shipments personally to the lab in Kamloops (Park and Grunenberg, 2015).

## 11.3 QAQC

QAQC samples included in laboratory submittals during drilling were only done during drilling by Margaux. A summary table of QAQC samples for years in which they are included is given in Table 11-1 and indicates the overall inclusion rate of QAQC samples is within industry standards. The drilling in 2017 does not include any CRMs for tungsten. Because only Margaux included QAQC samples, and only did drilling in the East Emerald deposit, only East Emerald has blindly inserted QAQC samples.

	Year	Primary Assays Blanks		nks W/Mo CRMs Au CRMs		Duplicates	% QAQC	
	2014	2,560	155	133	7	145	14.7%	
	2016	468	23	11	23	23	14.6%	
	2017	407	23	-	23	24	14.7%	
	Total	3,435	201	144	53	192	14.7%	

Table 11-1 Summary of QAQC samples in Drilling in East Emerald





### 11.3.1 Blanks

Blanks were included in drilling in East Emerald in 2014, 2106, and 2017, with results summarized below.

### 11.3.1.1 Tungsten Blanks

The detection limit for tungsten was typically 0.1ppm, but for analyses at ALS and some at Acme, the detection limit was 0.05ppm. There are a total of 203 blanks identified in drilling in East Emerald by Margaux. The results of the tungsten assays with failure criteria of ten times detection limit are given in Table 11-2. Two samples are excluded from this analysis. One was clearly identified as "drill core" on the certificate, and one was identified as "rock pulp". No other blanks submitted were identified as "rock pulp" and this one clearly had assays indicative of one of the tungsten CRMs. The failure rate of 32.8% overall is significant, indicating either a potential contamination problem or that the material is not an appropriate blank for tungsten. By comparison, the number of failures for gold at ten times the detection limit is eight, or approximately 4%. This is still higher than would be expected but implies the issue with the tungsten failures is not likely to be contamination.

Year	Blanks	W Fail at 10* DL	W % Failed
2014	155	56	36.1%
2016	23	5	21.7%
2017	23	5	21.7%
Total	201	66	32.8%

Table 11-2	East Emerald Blanks, Tungsten Results
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The plot of assay values of blanks in East Emerald is given in Figure 11-1 and shows that the tungsten assay for several of the blanks are greater than 10ppm but never more than 30ppm.





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Figure 11-1 East Emerald Blanks, Tungsten (Source: MMTS, 2021)

## 11.3.1.2 Molybdenum Blanks

The detection limit for Mo in the Margaux drilling is reported at 0.01, 0.05, and 0.1ppm. The plot of normalized assay values of the blanks in East Emerald drilling is given in Figure 11-2. 183 of the 201 blanks failed at the 10\*DL criteria for molybdenum, for a total failure rate of 91%. This is clearly not an appropriate blank material for Mo.





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Figure 11-2 East Emerald Blanks Normalized, Molybdenum (Source: MMTS, 2021)

## 11.3.1.3 Gold Blanks

The summary of results for gold assays of blanks is given in Table 11-3 and shows that the overall failure rate at ten times detection limit is 4%, with all failures occurring in 2014.

Year	Blanks	Au Fail at 10* DL	Au % Failed
2014	155	8	5.2%
2016	23	0	0.0%
2017	23	0	0.0%
Total	201	8	4.0%

Table 11-3 East Emerald Blanks, Gold Result
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The plot of assay values of blanks, normalized by dividing by the detection limit, is given in Figure 11-3 and shows that there are some significant failed blanks in 2014. There is no evidence that reassays were requested or that the database was corrected as would be standard protocol.







Figure 11-3 East Emerald Blanks Normalized, Gold (Source: MMTS, 2021)

## 11.3.2 Certified Reference Materials

Results for Certified Reference Materials (CRMs) for tungsten, molybdenum and gold are presented here. CRMs were included in 2014 and 2016 for tungsten and molybdenum and in 2014, 2016, and 2017 for gold.

## 11.3.2.1 Tungsten CRMs

Only drilling in 2014 and 2016 included blindly inserted CRMs with reference values for tungsten by Margaux in East Emerald. A summary of these samples is given in Table 11-4. The results for CDN-W-4 are shown to have a significant number of low failures. The results for OREAS700 are inconclusive as 9 of the samples exceed the upper limit of the test method, 10,000ppm and no overlimit test result is recorded.





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CRM	Year	Number of samples	EV W %	Avg of W %	Std Dev	CV %	Low Failures	High Failures	% Fail
CDN-W-4	2014	133	0.366	0.359	0.059	16.5	11	1	9.0%
OREAS 700	2016	11	0.989	0.966	0.004	0.4	N/A	N/A	N/A

## orold CBM Summary Tu

The process control chart for CDN-W-4 is given in Figure 11-4, in order of sample number which may not correspond directly to processing order. It is seen that in the early samples, seven results are shown under 0.3%. These are for assays done at the ALS Vancouver lab by aqua regia digestion with ICPMS only, and were processed in December 2014, and are in holes in the tungsten solids, E1433, E1423 and E1435. All other results were done by the Vancouver Acme lab as overlimit results by phosphoric acid leach with ICP. The certified expected value of 0.366% for CDN-W-4 is reported to be for a "variety of methods" which includes 4-acid digestion, but not aqua regia.

It is clear there is an issue with the ALS results, and it is likely due to the digestion method, but because this lab was responsible for only a small portion of the 2014 assays and these results are in the conservative direction, the results are considered acceptable. There also appears to be an increasing trend in the results which was potentially observed by the labs internal controls as well and resolved by calibration.



Figure 11-4 Process Control Chart for CDN-W-4, Tungsten (0.366%) (Source: MMTS, 2021)

It is noted that ALS was the primary laboratory in 2016. The only standard used for tungsten in 2016 drilling is OREAS700, with an expected value of 0.989% for digestion by 4-acid solution. In 2016, digestion at the ALS lab was by 4-acid digestion, not aqua regia as in 2014. However, overlimits





analysis was not employed for tungsten, and 9 of the 11 standard values give assay results ">10,000ppm". No process control chart or statistics can be made with these results. The best that can be said of the 2016 CRM analysis for tungsten is that the results do not appear to be low, and that the issue observed in the 2014 CRM results may have been addressed by calibration, change in digestion method, or something else. The highest assay value in the database in 2016 drilling is 7660ppm, so the lack of overlimits analysis in 2014 is not likely to influence the resource estimate.

### 11.3.2.2 Molybdenum CRMs

The same CRMs used for tungsten were also certified for molybdenum. A summary of results is given in Table 11-5. The results for CDN-W-4 are seen to be slightly below expected, and results for OREAS 700 are seen to be very good.

CRM	Year	Number of Samples	Mo EV ppm	Avg Mo ppm	Std Dev	CV %	Low Failures	High Failures	% Fail
CDN-W-4	2014	133	1100	1051.64	193.17	18.4%	10	1	8.3%
OREAS 700	2016	11	81	80.75	2.86	3.5%	0	0	0.0%
Total		144					10	1	7.6%

#### Table 11-5 East Emerald CRM Summary, Molybdenum

The process control chart for CDN-W-4 is given in Figure 11-5 in order of sample number. As for tungsten, there is a set of low failures in batches processed at the ALS Vancouver lab by aqua regia. Otherwise, the results are mostly consistently near the expected values with a couple of extreme failures that are potentially mislabeled blanks.

The process control chart for OREAS 700 is not shown, there are no failures, and the mean approximates the expected value.





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Figure 11-5 Process Control Chart for CDN-W-4, Molybdenum (1100ppm) (Source: MMTS, 2021)

## 11.3.2.3 Gold CRMs

The summary of gold CRMs for East Emerald is given in Table 11-6 in order of increasing grade. It is seen that the most frequently used CRM is CDN-W-4, used as a tungsten standard in 2014 with provisional value for gold of 0.319g/t.

CRM	Year	Number of Samples	Au EV g/t	Avg Au g/t	Std Dev	CV %	Low Failure s	High Failure S	% Fail
CDN-ME-14 (Provisional)	2017	2	0.100	0.089	0.006	7.2%	0	0	0%
CDN-W-4 (Provisional)	2014	132	0.319	0.251	0.051	20.3%	75	0	57%
CDN-GS-P4C	2017	6	0.362	0.363	0.039	10.7%	0	1	17%
OREAS 700	2016	11	0.506	0.504	0.018	3.6%	0	0	0%
CDN-GS-1R	2017	9	1.210	1.140	0.057	5.0%	0	0	0%
CDN-GS-4E	2014	7	4.190	0.008	0.006	76.2%	7	0	100%
CDN-GS-10F	2017	6	10.300	8.275	4.075	49.2%	3	0	50%
OREAS 12a	2016	12	11.790	11.850	0.255	2.2%	0	0	0%
Total		185					85	1	46%

Table 11-6East Emerald CRM Summary, Gold





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The results from this CRM are low, with the mean of the assay results below the -3 standard deviation failure line as shown in Figure 11-6. Because this CRM for gold is provisional, this would not present a problem if there were other reliable CRMs in the 2014 drilling, however, the only other CRM used in 2014 had only seven entries, and all failed low. Effectively, there are no reliable CRM results for gold in the 2014 drilling, which represents the majority of the Margaux exploration in East Emerald.



Figure 11-6 Process Control Chart for CDN-W-4, Gold (0.319g/t) (Source: MMTS, 2021)

The CRMs other than CDN-W-4 are plotted in a normalized plot in Figure 11-7 which shows the remaining 2014 CRMs failing low, below -6 standard deviations. The 2016 results are seen to be good, all within the +-2 SD range and no failures. In 2017, there are one high failure and three low failures, with most results below the expected values. There are no significant problems with the 2016 and 2017 gold CRMs. The 2014 CRMs, which plot below the -6 standard deviation line and do not show, as well as the CDN-W-4 results plotting just above 0.2ppm, are done by the ALS Vancouver lab and processed by aqua regia, which is obviously not reliable for gold.





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Figure 11-7 Normalized Process Control Chart, Au CRMs (Source: MMTS, 2021)

## 11.3.3 Field Duplicates

A total of 192 field duplicate samples are available in the drilling by Margaux in East Emerald. Results are presented here for tungsten, molybdenum, and gold.

## 11.3.3.1 Field Duplicates, Tungsten

Simple statistics of the tungsten values of these assays are given in Table 11-7 and show the average of the duplicate samples to be 4% higher than the database samples. The analysis of the half absolute relative difference (HARD) gives only 43% less than 10%. The expectation for field duplicates is that 70% is normally below 10% HARD. This indicates a greater variation between duplicate samples than is normal and a slight low bias to the assay database.

 . / Eust Emert	and rungsten	i i icia Dapin	cates simp	ie Statistics		
Number	Average	W (ppm)	Standard	Deviation	Less than 10%	
Number	D1	D2	D1	D2	HARD	
192	548.26	570.06	1122.94	1147.00	43%	
Percent Difference			4.0%			

 Table 11-7
 East Emerald Tungsten Field Duplicates Simple Statistics

The scatter plot of duplicate pairs is given in Figure 11-8, with the 1:1 line shown in green. Linear regression gives a nearly 1:1 slope with reasonable R<sup>2</sup> value. The field duplicates do not give indication of selection bias and show the concentration of tungsten to be highly variable within mineralization.





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Figure 11-8 East Emerald Field Duplicates, Tungsten (Source: MMTS, 2021)

## 11.3.3.2 Field Duplicates, Molybdenum

The simple statistics of the molybdenum paired assays, with three outliers removed, is given in Table 11-8 and show that the mean and standard deviation of the set of duplicate pairs is very close with only a 0.5% difference. However, the % less than 10% HARD at 41% is less than would normally be expected for field duplicates.

Number	Average I	Vlo (ppm)	Standard	Deviation	Less than 10%	
Number	D1	D2	D1	D2	HARD	
189	44.17	43.95	98.63	90.84	41%	
Percent Difference			-0.5%			

 Table 11-8
 East Emerald Molybdenum Field Duplicates Simple Statistics

The scatter plot of Mo duplicate pairs is given in Figure 11-9 and indicates that the duplicate assays are lower, which is not supported by calculation of the average values and is an effect of the few samples with assays greater than 100ppm. The analysis by the HARD statistic and scatter plot indicates the molybdenum concentration to be highly heterogenous.





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Figure 11-9 East Emerald Field Duplicate Pairs, Molybdenum (Source: MMTS, 2021)

## 11.3.3.3 Field Duplicates, Gold

The simple statistics of the gold pairs is given in Table 11-9 and shows that the mean and standard deviation of the field duplicate pairs is very close, with only a 0.6% difference. However, the pairs are not very similar to each other as indicated by the 38% with less than 10% difference, much lower than would be expected for field duplicates, even lower than is normally seen for gold. The implication is that there is no selective bias observed, but that the gold mineralogy is highly heterogenous.

	Number	Average	Au (g/t)	Standard	Deviation	Less than 10% HARD	
	Number	D1	D2	D1	D2		
	192	0.105	0.106	0.457	0.451	38%	
	Percent Difference			0.6%			

The scatter plot of gold field duplicate pairs is given in Figure 11-10 and shows the significant variation. The best fit line plots with a slope less than 0.9, indicating the duplicates are lower than the primary assays, however this is driven by the 5 assays with mean assay value above 1.0g/t. There are clearly more pairs that plot above the 1:1 line than below.





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Figure 11-10 East Emerald Field Duplicates, Gold (Source: MMTS, 2021)

## **11.4 QAQC Conclusions and Recommendations**

The QP concludes that the sampling protocols, analytical methods, security measures and QAQC procedures are acceptable for resource estimation.

The tungsten and molybdenum assays of blank material included in East Emerald would normally indicate potential significant contamination or other problems. Because the gold blank results are acceptable, these assay values are not in the range of interest for tungsten, and the blanks run by the labs themselves give acceptable results, it is presumed the blank material itself is not suitable for tungsten and the 2014-2017 assays are not rejected. The blank material is also clearly not appropriate for molybdenum.

The 2014 drilling represents the majority of drilling in East Emerald, the gold CRMs used in this drilling are problematic. There are assays in 2014 drilling that appear to have been done by an incomplete assay method as indicated by low CRM results for all three elements evaluated. The 2017 drilling does not include CRMs certified for tungsten and molybdenum. The 2017 assays were done by aqua regia digestion, an incomplete method for tungsten. No tungsten CRMs were included in 2017, the analysis method reports a maximum of 200ppm, for which many intervals are reported,





and no overlimits were done. There are 54 assays from 2017 in the database reported at 200ppm for which re-analysis may be indicated.

The field duplicates have results for pairs much more different that would normally be expected, no sampling bias is observed, and the QP concludes that the mineralized zones are highly heterogenous.

The QP recommends that:

- Certified blank material be sourced and used for all future drilling at the Jersey-Emerald Project.
- Standard protocols call for two CRMs of different grades to be included in each batch of 40 samples. It is recommended that future drilling at this project include CRMs that meet this criteria for each element for which a resource estimate is anticipated.
- The database includes assays for all three elements tested by aqua regia digestion which are shown by CRM analysis to be significantly lower than expected. The affected holes, E1433, E1423 an E1435, are of importance to the resource estimate and an opportunity exists to reassay significant intervals with a possible increase in assay values.
- The database contains 54 tungsten assays from 2017 reported on certificates as ">200ppm" by aqua regia digestion and ICP and are represented as 200ppm in the database. The potential benefit of re-analysis of these core intervals is to be considered.
- Check assays for gold are recommended for 2014 drilling due to the issues with the provisional standard that was used.
- Coarse preparation duplicates are normally included in the QAQC samples to assess the laboratory preparation stage. It is recommended that future drilling include coarse duplicates.





## 12.0 Data Verification

## 12.1 Site Visit

Sue Bird visited the Jersey-Emerald Project site on 26-28 January 2021 and again from 28-30 June 2021. Sue reviewed drill pad locations, drilling and sampling protocols, the core storage, and the QA/QC procedures. The underground workings were examined for all accessible drifts. The geology and mineralization within pertinent drillholes were also inspected and reviewed with check assays of Wo3 and Mo collected in January 2021, and additional check assays of Mo and Pb-Zn collected in June 2021.

## 12.2 Survey

Drilling reports by Sultan indicate collar locations to be identified by handheld GPS. Much of the historical collar data was recorded in local mine grid and later converted to UTM. The drilling reports by Margaux indicate all drill collars to be located by handheld GPS and although a collar survey was planned it is not reported as completed. A 2016 LiDAR survey resulted in drillhole elevations reconciled with topography (Caron, 2018), however during modeling there were still some inconsistencies noted. A survey of the collar locations is recommended to remove any remaining questions about drillhole locations.

## 12.3 Data Audit

## 12.3.1 Certificate Checks

The database provided did not include certificate numbers for drilling before 2014. The database was appended by hand with certificates number to the extent possible. The domains in the resource areas contain 1,851 assays. Of these assays, 934 have certificate numbers identified, or 50.4%. A summary of samples and certificate checks is given in Table 12-1.

Of the samples with certificates, 275 database values were checked against assay certificates for a total of 14.8% and no errors were found for tungsten. A total of 52 omissions of Au assays were discovered and these were appended to the database. For 19 certificates from 2008 comprising 1,244 assays in the complete dataset, it was discovered that the Mo values had been appended to the MoS<sub>2</sub> column, these were corrected. This affected only 23 samples within the resource domains, and were the only errors found for Mo.

For drilling outside of the resource areas, there are a significant number of assays for elements of interest, such as lead, zinc, tungsten, and gold, on certificates that are not included in the database. For completeness, the database should be amended with all the available data.





Table 12-1	Summary of C	ertificate C	Check Results
------------	--------------	--------------	---------------

Source	Number	% of All Samples in Domains
Samples in Domains	1,851	
Samples with Certificates Identified	934	50.4%
Assays checked	275	14.8%
Samples without Certificates Identified including Historic	917	49.6%
Historic Samples	703	38%

### 12.3.2 Check Assays

## 12.3.2.1 2021 MMTS Check Assays

Five samples were collected from drill core from stored core from exploration in East Emerald in 2007, in holes JS0739 and JS0737 during the initial site visit in January 2021. These samples were bagged, tagged, and shipped to Activation Labs in Kamloops, BC for preparation and shipped to Activation Labs in Ancaster, Ontario for processing by Sodium Peroxide Fusion with ICP-MS for both W and Mo.

The original samples were processed by Acme in in Vancouver by Phosphoric acid leach and ICP-ES for W and Aqua Regia digestion with ICP-MS for Mo.

An additional 9 drill core samples were selected during the June 2021 site visit from five drillholes. These samples were bagged, tagged, and shipped for preparation and processing at Activation Labs in Kamloops, BC. Analysis was done by Sodium Peroxide Fusion with ICP for lead, zinc, and molybdenum. The 7 samples with greater than detection limit results for Mo are included in the analysis below.

Simple statistics of the results are presented in Table 12-2. It is seen that the average results for tungsten are similar, with a 15% relative difference indicating the 2007 database values are somewhat higher. The results for molybdenum also show that the 2021 results are lower, with a 18.4% difference.

Deveneter	Tung (5 sam	sten 1ples)	Molybdenum (13 samples)			
Parameter	2007 Acme	2021 ActLabs	2007 Acme	2021 ActLabs		
Average (ppm)	1192	1024	1725	1434		
% Difference	15.	2%	18.4%			
Standard Deviation	358.3	378.4	2486	2384		

### Table 12-2 East Emerald 2021 Check Assay Simple Statistics

Scatter plots of the tungsten results are given in Figure 12-1 and molybdenum results in Figure 12-2. The QP is satisfied that high assay results for both tungsten and molybdenum are confirmed in significant zones of mineralization and is not concerned by the relative differences which may be due to oxidation and absorption of water, as much time has passed, and the samples have not been stored in controlled conditions.







Figure 12-1

East Emerald 2021 Check Assays, W (Source: MMTS, 2021)





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Figure 12-2 East Emerald 2021 Check Assays, Mo (Source: MMTS, 2021)

## 12.3.2.2 2006 Check Assays

In 2006, 24 – 250g samples of stored split pulps were submitted to Becquerel Laboratories in Ontario for tungsten analysis by neutron activation (Giroux and Grunenberg, 2006). The Acme samples were assayed by phosphoric acid leach with ICP-ES. The simple statistics of the duplicate pairs is given in Table 12-3. The percent difference of the means shows that the average of the samples by neutron activation is 8.1% higher.

20	UU CHECK Assays						
	Deveneter	Tungsten					
	Parameter	2006 Acme	2006 Becquerel				
	Average (ppm)	973.8	1056.6				
	% Difference		-8.1%				
	Standard Deviation	582.2	587.8				

#### 2006 Charle Assault Table 12-3







The scatter plot of the check assays showing the best fit line with a slope just over 1 and R<sup>2</sup> value of 0.99 (Figure 12-3) confirms the slight increase in the Becquerel assays and the excellent correlation between the duplicate pairs.



Figure 12-3 East Emerald 2006 Check Assays, Tungsten (Source: MMTS, 2021)

## **12.4** Conclusions and Recommendations

The QP concludes that the database is suitable for resource estimation at this time but that future studies would benefit from the following recommendations:

- A collar survey is recommended to remove any questions regarding drillhole locations that have been changed to reconcile with topography or errors induced during conversion from mine grid coordinates.
- For drilling outside of the resource area, there are a significant amount of assay values of metals that could be of interest that are not included in the resource database from both historic and non historic drilling. It is recommended a full review of the assay database be accomplished to take advantage of all existing data prior to further resource modeling.





## 13.0 Mineral Processing and Metallurgical Testing

Apex has not undertaken any mineral processing or metallurgical testing.

Giroux and Grunenberg (2014) provide a summary of mineral processing or metallurgical testing undertaken by previous operators in "Technical Report for the Jersey-Emerald Property, Salmo, BC, March 28, 2014".





## **14.0** Mineral Resource Estimates

The Mineral Resource estimate has an effective date of July 26, 2021. The resource estimate was prepared by Sue Bird, P.Eng., of MMTS.

## 14.1 Jersey Mineral Resource

The Mineral Resource statement for the Jersey-Emerald Project with an effective date of July 26, 2021, is listed in Table 14-1. Mineral Resources were estimated using the 2019 CIM Best Practice Guidelines and are reported using the 2014 CIM Definition Standards. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

The base case cut-off grade within the "reasonable prospects of eventual economic extraction" constraining pit is a Net Smelter Return (NSR) of CDN\$25/tonne for open pit resources and CDN\$60/tonne for underground resources, as highlighted in Table 14-1. The Table includes a range of NSR cut-off grades to show the sensitivity of the resource estimate to variations in cut-off.

	Class	Cut-off	Tonnage	NSR	Wo3	Мо	Au	Wo3 Metal	Mo Metal	Au Metal
Source		AuEq (CDN \$/t)	(tonnes)	(CDN\$)	(%)	(%)	(gpt)	('000 lbs)	('000 lbs)	(ounces)
		25	1,045,153	55.04	0.157	0.015	0.029	3,618	334	958
		30	970,440	57.14	0.163	0.015	0.031	3,483	323	958
	Indicated	35	864,486	60.16	0.171	0.016	0.034	3,255	311	945
		40	739,976	63.93	0.181	0.018	0.039	2,950	289	925
Onen Dit		50	461,891	75.51	0.211	0.024	0.042	2,148	246	628
Open Pit	Inferred	25	1,472,801	63.06	0.175	0.025	0.012	5,689	802	559
		30	1,398,473	64.94	0.180	0.026	0.011	5,559	792	504
		35	1,285,247	67.78	0.188	0.028	0.011	5,313	782	471
		40	1,095,164	72.98	0.201	0.031	0.012	4,853	741	412
		50	797,312	83.52	0.227	0.039	0.009	3,994	680	231
Underground	Indicated	within CDN\$60	427,650	82.40	0.213	0.036	0.101	2,007	342	1,387
onderground	Inferred	shape	3,655,244	90.79	0.248	0.026	0.109	20,017	2,087	12,857
Open Pit &	Indicated		1,472,803	62.99	0.173	0.021	0.050	5,625	676	2,345
at Base Case	Inferred	varies as above	5,128,045	82.82	0.227	0.026	0.081	25,706	2,889	13,415

#### Table 14-1 Jersey-Emerald Mineral Resource Estimate – Total Project

Notes for Table 14-1:

1. Resources are reported using the 2014 CIM Definition Standards and were estimated using the 2019 CIM Best Practices Guidelines.

2. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

3. The Mineral Resource has been confined by a "reasonable prospects of eventual economic extraction" pit using the following assumptions: 150% pit case using an Wo3 price of US\$300/tonne, a Mo price of US\$15.00/lb and an Au price of US\$1600/oz at a currency exchange rate of 0.77 US\$ per \$CDN; 90% payable Au, 99% Mo payable,3% conversion to APT of Wo3; and typical roasting, refining, transport, and insurance costs. A 1.5% royalty is applied to the NSR calculation.

4. Metallurgical recoveries of 85%, 80% and 75% Tungsten, Molybdenum, and gold respectively.

5. Pit slope angles are assumed at 45<sup>e</sup>. Mining costs are CDN\$5.00/tonne, and Processing plus General and Administration (G&A) costs of \$25/tonne milled.

6. The specific gravity of the deposit has been assigned as 3.55 in mineralized domains and 3.21 outside domains.

7. Numbers may not add due to rounding.





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

## 14.2 Key Assumptions and Data used in the Estimate

A summary of the drillholes within the Jersey-Emerald block model and used for interpolation is provided in Table 14-2. Figure 10-1 is a plan map showing the drillhole traces and the claims boundaries.

		East Emer	ald		East Dod	ger		Dodge	r	Total			
Year	DHs	Total Length (m)	Interval Length (m)	DHs	Total Length (m)	Interval Length (m)	DHs	Total Length (m)	Interval Length (m)	DHs	Total Length (m)	Interval Length (m)	
Historic	43	4,403	372	58	3,204	235	35	1,507	154	136	9,114	760	
2005				16	1,706	180				16	1,706	180	
2006	8	1,016	118							8	1,016	118	
2007	15	2,686	336	7	2,745	141				22	5,431	477	
2008	13	1,765	163	7	2,405	33				20	4,171	197	
2014	33	5,980	612	1	323	3				34	6,303	615	
2016	3	801	40							3	801	40	
2017	2	455	43							2	455	43	
Total	117	17,107	1,683	89	10,384	592	35	1,507	154	241	28,997	2,429	

## Table 14-2 Summary of Drillhole and Assays used in the Jersey Resource Estimate

## 14.3 Geologic Modeling

3D interpretations of mineralized domains have been created using implicit modelling (IM). Consideration was given to W, Mo, and Au grades in the assayed drillholes, as well as previous structural interpretations and previous mining shapes.

The combined net smelter return (NSR) of the three elements has been used to define domain limits. Wireframes have been created by manual tagging of assay intercepts with an NSR grade greater than approximately \$20/tonne NSR and an estimated true thickness of at least 1.0m. This has been done to include intercepts below the resource cut-off grade of \$60/tonne NSR over 2m to provide continuity of mineralized solids, and to include internal dilution in the interpolations. Economic criteria are discussed further in 14.9.

Metal grades can be highly variable over short distances and in some areas (particularly East Dodger) previous operators tended to only assay the high-grade intervals which are often thinner than modern bulk mining methods can recover. Therefore, correlation of higher grades is difficult, which has been mitigated by the inclusion of surrounding lower grade mineralization. This improves apparent continuity between drillhole intercepts, enhances interpretation, and allows for the inclusion of model or "internal" smoothing or dilution. The interpretive process has involved a great deal of inspection of intercepts to ensure that they are wide enough in true thickness, whether dilution is required to achieve this minimum thickness, and if so, how much and at what grade.





Tagged intercepts have been used with the Implicit Modelling Tool in MineSight (MSIM<sup>®</sup>) to create footwalls and hanging walls for the development of mineralized solids. The resulting surfaces have been converted to domain solids by clipping to topography, to a maximum of 50m from an outer boundary intercept, and within 10m of previous mining areas

There are 21 domains that have been interpreted in the East Emerald, Dodger, and East Dodger areas for Wo3 and Mo interpolations. East Emerald has been interpreted to have 9 mineralized domains (domains 1-9), East Dodger has eight domains (domains 10-17), Dodger has 4 domains (domains 18 to 21). These are illustrated in a three-dimensional view looking northwest in Figure 14-1.



Figure 14-1 Wo3 and Mo Domains used for the Jersey-Emerald Resource Estimate (Source: MMTS, 2021)







The Au modelling used more restrictive interpolations domains. There are a total of ten Au mineralized domains, as illustrated in Figure 14-2.

Figure 14-2 Au Domains used for the Jersey-Emerald Resource Estimate (Source: MMTS, 2021)

## 14.4 Assay Statistics, Capping, and Outlier Restriction

The assay statistics were examined using boxplots, histograms, and cumulative probability plots (CPPs). Figure 14-3 through Figure 14-5 are CPPs for the Emerald, East Dodger and Dodger areas respectively.

The capping values for each area and domain are summarized in Table 14-3. Also summarized in this table are the Outlier Restriction values used during interpolation. These are shown here for clarity on how the high-grade outliers have been confined during interpolations. This is discussed further in Section 14.8 which summarizes the block modelling parameters.




		Capping Values			Out	lier Restrict	ion
Deposit	Dom	Wo3	Мо	Au	Wo3	Мо	Au
		(%)	(%)	(gpt)	(%)	(%)	(gpt)
	1	0.8	99	1.1	0.8	99	1.5
	2	99	99	1.1	99	99	
	3	0.6	99	1.1	0.6	99	2
	4	99	99	1.1	99	99	1
Emerald	5	99	99	1.1	99	99	2
	6	99	99	99	99	99	
	7	0.7	99	99	0.7	99	
	8	99	99	1.1	99	99	99
	9	99	99	1.3	99	99	30
	10	1	0.6	50	0.6	0.4	na
	11	0.11	0.9	1.1	0.6	0.4	2
	12	1.1	0.7	99	1.1	0.7	na
East	13	1.2	1	99	1.2	0.4	99
Dodger	14	1.1	0.9	99	1	0.5	99
	15	1.1	1	1.1	1.1	0.9	1
	16	0.8	99	99	0.8	99	na
	17	1.2	99	99	1.2	99	na
	18	1.1	99	99	1.1	99	na
Dodgor	19	1.05	99	99	1	99	na
Douger	20	0.9	99	99	0.7	99	na
	21	1	99	99	0.9	99	na

## Table 14-3 Summary of Capping and Outlier Restriction by Domain







Figure 14-3 CPP of Wo3 Assay Grades by Domain – Emerald (Source: MMTS, 2021)



Figure 14-4 CPP of Wo3 Assay Grades by Capping Domain – East Dodger (Source: MMTS, 2021)





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Figure 14-5 CPP of Wo3 Assay Grades by Capping Domain – Dodger (Source: MMTS, 2021)

Assay statistics for the capped gold grades are summarized in Table 14-4, illustrating that the composited grades equal assayed grade and therefore compositing has not introduced a bias. Also illustrated is that the grade distribution is generally lognormal, and the coefficient of Variation (C.V.) is equal to or below 2.0, meaning that interpolation by linear methods is generally acceptable.

Source	Parameter	Wo3- Emerald	Wo3-East Dodger	Wo3- Dodger	Mo- Emerald	Mo-East Dodger	Au- Emerald	Au-East Dodger
	Num Samples	1257	600	216	1257	600	297	87
Δεεργε	Max	2.15	1.2	1.1	0.64	1.0	1.3	1.1
A33843	Wtd mean	0.1437	0.2063	0.3941	0.0109	0.085	0.1948	0.0778
	Weighted CV	1.1376	1.7588	0.9964	3.6915	2.1126	1.9343	2.2435
	Num Samples	888	357	113	888	357	157	73
Comps	Max	0.916	1.2	1.1	0.64	0.823	1.3	1.1
comps	Wtd mean	0.1437	0.2064	0.394	0.0109	0.085	0.1949	0.0771
	Weighted CV	0.9083	1.4069	0.7427	3.2031	1.7267	1.6575	1.9129
Difference (%)		0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.9%

Table 14-4	Assay	Statistics com	pared to Com	posite Statistics





## 14.5 Compositing

Compositing has been done on 2m composites, honoring the domain boundaries. This length is chosen as the minimum minable width for underground mining, as well as to be larger than the majority of existing assay intervals within the domain, as illustrated in the histogram below (Figure 14-6).



Figure 14-6 Histogram of Assay Lengths (Source: MMTS, 2021)

#### 14.6 Bulk Density Assignment

The bulk density has been assigned based on 501 measurements of sg that were in the Jersey database provided. The mean sg values within the mineralized domains and outside the mineralized domains has been used to define the resource. A histogram showing the sg values is given in Figure 14-7.







Figure 14-7 Histogram of SG Values within Mineralized Domains (Source: MMTS, 2021)

#### 14.7 Variography

Variography has been done on groups of domains within each deposit area to determine primary anisotropy and aid in search distances to be used during interpolations, and in Classification. Figure 14-8 below illustrates the variogram models for Wo3 in the East Emerald mineralized zones (Domains 1 through 9), with the principle axes directions aligning roughly with the orientations of the mineralized envelopes.









Variography of Wo3 in the East Emerald Domains (Source: MMTS, 2021)



Table 14-5



#### 14.8 Block Modelling

Block dimensions are 4m x 4m x 4m. The block model is defined as a Multiple Percent Model, with up to two mineralized zones per block associated with block percent items. Final grades are the weighted average grades within the mineralized zone in the blocks. The extent of the block model is summarized in Table 14-5 below.

Jersey-Emerald Model Extents					
Direction	Minimum	Maximum	Size	length	# Blocks
Easting	483,400	485,052	4	1,652	413
Northing	5,438,600	5,440,600	4	2,000	500
Elevation	950	1,702	4	752	188

Search parameter orientations varied based on the mineralized zone orientations as summarized in Table 14-6. In some cases the domain has been split into sections when the orientation of the mineralized zone changes. These new interpolations zones are coded with an "ICODE", with soft boundary between the ICODE within the same domain. The rotation values Major, Minor and Vertical are the rotation of the principal axes about the Y-axis, X-axis, and Z-axis, respectively, using the right-hand rule with positive rotation upwards. Interpolation has been done using inverse distance squared (ID2) in all cases.

	Axes Orientation (degrees)						
ICODE	Major	Minor	Vertical	ICODE	Major	Minor	Vertical
10	35	0	-5	101	240	0	-10
11	75	0	-35	110	190	0	-30
12	35	0	-20	111	200	0	-5
20	35	0	-5	120	190	0	-5
21	70	0	-40	130	175	0	-20
22	20	0	-30	140	175	0	-15
30	0	0	0	150	135	0	-30
31	30	0	-30	151	0	0	0
40	40	0	-10	160	210	0	-20
50	45	0	-15	161	160	0	-5
60	0	0	-20	170	170	0	-15
61	90	0	-45	180	150	0	-20
70	20	0	-40	181	195	0	-65
71	20	0	-20	190	0	0	-35
80	240	0	-30	191	100	0	-20
81	350	0	-15	200	0	0	-40
90	0	0	-20	201	75	0	-15
100	200	0	-30	210	30	0	-55

 Table 14-6
 Summary of Search Orientations





The restrictions on search distances and composite selection for each of the four passes of the interpolations are given in Table 14-7.

Matal	Interpolation			Pass	
Ivietai	Parameter	1	2	3	4
	Search - major	25	50	100	100
All	Search - minor	25	50	100	100
	Search - vert	5	10	20	20
	Min. # Comps	4	4	6	2
Wo2	Max. # Comps	8	8	12	8
W05	Max / DH	2	2	3	3
	Max / Quadrant	2	2	2	na
	Min. # Comps	9	9	6	1
Мо	Max. # Comps	12	12	12	9
IVIO	Max / DH	3	3	3	3
	Max / Quadrant	2	2	2	na
	Min. # Comps	4	4	4	2
۸	Max. # Comps	8	8	8	8
Au	Max / DH	2	2	2	3
	Max / Quadrant	2	2	2	na

Table 14-7	Summary of Search Distances and	d Composites Selection Criteria by Pas	SS
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The interpolations have also restricted the high-grade outliers to ensure that metal content is not over-estimate in any domains. The outlier values are summarized in Table 14-3 along with the capping values, for clarity on how the high grades are constrained. Composite values above the Outlier values are used in the interpolations only up to 5m from the composite.

#### 14.9 Classification

Classification is based on the average distance to two drillholes using only drillholes for which an Assay Certificate is available. Blocks are considered Indicated if the average distance to 2 drillholes is less than or equal to 35m, which is the average range at 80% of the sill between the major and Minor axes of the variogram model for Wo3 in the East Emerald domains, as illustrated in Figure 14-8.

Inferred blocks are all blocks that have been interpolated and have not been classed as indicated. The maximum search distances are 100m, which is just beyond the range of the variograms, as illustrated in Figure 14-8.

Figure 14-9 below illustrates the location of the Indicated and Inferred blocks with respect to the mineralized domains.







Figure 14-9 Three-dimensional view of the Classification – looking Northwest

#### 14.10 Model Validation

#### 14.10.1 Global Grade Validation

Resource validation to ensure there was no global bias compared NN grades to those of the final grade interpolation at zero cut-off. Table 14-8 summarizes this comparison, illustrating that the difference in Wo3 grades by domain is within 2% overall. Gold and Mo show higher differences but remain conservative for the model.





Table 14-8	Summary of Model Grade Comparison with De-Clustered Composites					
Demonstern	Wo	8 (%)	А	u	Мо	
Parameter	ID	NN	ID	NN	ID	NN
Num Samples	131,064	131,064	19,776	19,776	130,914	130,914
Num Missing	0	0	3	3	150	150
Min	0.001%	0%	0	0	0	0
Max	2.38%	1.019%	1.10gpt	46.78gpt	0.666%	7.623%
Weighted mean	0.148%	0.151%	0.22gpt	0.232gpt	0.018%	0.021%
Weighted CV	0.67	0.86	1.3	6.2	2.2	4.1
Difference	-2.0%		-4.6%		-12.6%	

#### 14.10.2 Grade-Tonnage Curves

Grade-tonnage curves were created to compare the Wo3, Mo and Au (in the Au zones only) interpolated grades with the de-clustered composite grades. Figure 14-10 through Figure 14-12 illustrate this comparison for Wo3, Mo, and Au respectively, showing increased smoothing (reduced grades and increased tonnage) compared to the NN grade curves. The difference is large for Au due to a very few very high Au grades with large influence on the mean distribution of the NN model.



Figure 14-10 Grade-Tonnage Curve Comparison for Wo3 (Source: MMTS, 2021)





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Figure 14-11 Grade-Tonnage Curve Comparison for Mo (Source: MMTS, 2021)



Figure 14-12 Grade-Tonnage Curve Comparison for Au (Source: MMTS, 2021)

#### 14.10.3 Visual Comparisons

Further validation on local grade estimation has been done through visual comparisons of the modelled grades with the assay and composite grades in section, plan and through three-dimensional





checks. Figure 14-13 to Figure 14-15 illustrate the block grades and composite grades in east-west cross-sections for each deposit within the resource. Ok grades show similar grade distributions and values throughout the model to that of the drillhole data. On all sections, the drillhole data shown is  $\pm 30$ m of the section.



Figure 14-13 Model Compared to Assays (+/- 30m) - Wo3 – Emerald, Section 5440000N (Source: MMTS, 2021)





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Figure 14-14 Model Compared to Assays (+/- 30m) - Mo Dodger – Section 5439328N (Source: MMTS, 2021)





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Figure 14-15 Model Compared to Assays (+/- 50m) – Au East Dodger – Section 5440004 (Source: MMTS, 2021)

## 14.11 Reasonable Prospects of Eventual Economic Extraction

The metal prices, recoveries, smelter terms and net smelter prices (NSP) are summarized in Table 14-9. Metal prices are based on historic price charts as determined by the following references: for Mo the average 3-year trailing average historic prices (Metalary, 2021), for Au the Kitco 3-year trailing average price charts (Kitco, 2021), and for W03 the prices published by the International Tungsten Association between 2010 and 2019 and confirmed to 2020 (Statistica, 2021).





Open pit resources are confined by a "reasonable prospects of eventual economic extraction" shape defined by a Lerchs-Grossman pit using the 150% case of the NSPS in the table, pit slopes of 45 degrees open pit mining costs of CDN\$5.00/tonne, and Processing plus General and Administration (G&A) costs of \$25/tonne milled.

Description	Values	Units
Process Recovery		
Tungsten	85.00%	%
Molybdenum	80%	%
Gold	75.0	%
Prices		
APT Price	\$300	US\$/mtu Wo3
Wo3 Price	\$13.61	US\$/lb Wo3
Mo Price	\$15.00	US\$/lb
Au Price	\$1,600.00	US\$/oz
US Exchange rate	0.77	US\$/CDN\$
APT Price CDN	390	CDN\$/mtu Wo2
Wo3 Price CDN	17.67	CDN\$/lb Wo3
Mo Price CDN	19.48	CDN\$/lb
Au Price CDN	2077.92	CDN\$/oz
Smelter Terms		
Tungsten Conc		
APT Wo3 Recovery	97%	%
Insurance	0.15%	%
Wo3 Delivered to Smelter	1323	lbs Wo3/WMT
Net payable Wo3 APT	1283	lbs Wo3/WMT
Transportation	\$100.00	CDN\$/WMT
Insurance	\$25.00	CDN\$/WMT
Moly Conc		
Mo payable	99.0%	%
Transportation Losses	1.50%	%
Sales	0.50%	
Mo Transportation Losses	1097	lbs Mo/WMT
Net payable Mo in Concentrate	1086	lbs Mo/WMT
Roasting Charge	\$2,000.00	CDN\$/WMT
Transportation	\$100.00	CDN\$/WMT
Sales	\$106.83	CDN\$/WMT
NSR Molybdenum Concentrate	\$18,945.71	CDN\$/WMT
Gold		
Au payable	90%	%
Net Smelter Price for Recovered Metal		
Tungsten (Wo3)	\$17.05	CDN\$/lb Wo3
Molybdenum (Mo)	\$17.27	CDN\$/lb Mo
Gold (Au)	\$60.13	US\$/oz Au

Table 14-9	Metal Prices, Recoveries,	Smelter Terms and N	let Smelter Price (NSP)
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The underground mining resource is considered to have reasonable prospects of eventual economic extraction when the following criteria have been met:

- a) NSR is above CDN\$60.00 / tonne
- b) Domain true thickness is above 2m

Note that the True Thickness of the mineralized domain has been interpolated to each block based on the true thickness of the assays, calculated using the azimuth and dip of the domain.

Isolated blocks satisfying the above criteria have not been considered. The resulting resource pits and underground resource shapes are illustrated in Figure 14-16, along with the current underground openings. All existing underground openings have been excluded from the mineralized shapes and resource estimate.



Figure 14-16 Three-dimensional view looking NE of the "reasonable prospects of eventual economic extraction" pit (golden) and underground (dark blue) shapes with previous underground workings (yellow)

#### 14.12 Risk Assessment

A description of potential risk factors is given in Table 14-10 along with either the justification for the approach taken or mitigating factors in place to reduce any risk.





#	Description	Justification/Mitigation
1	Classification Criteria	Indicated based on Variograms in the Emerald deposit
2	Geologic Model	Geologic interpretations and orientations of previous underground working considered when creating new geologic confining shapes for the resource interpolations.
3	Metal Price Assumptions	Cut-off is based on \$US300/mtu Wo3, \$US15.00/lb Mo and \$US1600 Au, which are all at or below the current 3-year trailing average.
4	High Grade Outliers	Capping and outlier restriction applied to ensure mean grade match data. Grade-tonnage curves show model validates well with composite data throughout the grade distribution.
5	Processing and Mining Costs	Assumed from comparables.
6	Previous underground mining	Site visit, production records confirm tonnage of previous mining is close to mined-out solids provided. Where location of workings/pillars is in questions, resources were not included.

## Table 14-10 List of Risks and Mitigations/Justifications



Moose Mountain

## 15.0 Mineral Reserve Estimates

Not applicable to this Report.

## 16.0 Mining Method

Not applicable to this Report.

## 17.0 Recovery Methods

Not applicable to this Report.

## 18.0 Project Infrastructure

The Jersey-Emerald Property has historic formerly and currently permitted open pits, extensive underground workings, existing tailings facilities, an extensive road network, access to power, access to a workforce, and access water for future mine development and operation.

## **19.0** Market Studies and Contracts

Not applicable to this Report.

## 20.0 Environmental Studies, Permitting and Social or Community Impact

Not applicable to this Report.

## 21.0 Capital and Operating Costs

Not applicable to this Report.

# 22.0 Economic Analysis

Not applicable to this Report.





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# 23.0 Adjacent Properties

Figure 22-1. Some of the closest past producers are discussed here. The information is based on Minfile reports that have not been verified by the QP. A map showing the location of these properties is given in Figure 22-1. The information presented is not necessarily indicative of the mineralization on the Jersey-Emerald Property.



Figure 22-1 Location Map of Adjacent Properties (Source: MMTS, 2021)





#### 23.1 HB Mine (MINFILE 082FSW004)

The HB property is located on Aspen Creek, a tributary of Sheep Creek, directly north of the Jersey-Emerald property. The north end of the No. 1 ore body outcropped at an elevation of 1219m, west of Aspen Creek, and almost 1.6km north of Sheep Creek.

The Consolidated Mining and Smelting Company of Canada (CMSC, which became Cominco Ltd. (Cominco)) optioned the claims in 1911. The No. 2 level crosscut was driven during the winter, but results were disappointing, and the option was dropped in 1912. On the expiry of the lease, the entire property was optioned to a Spokane syndicate operating under the name Hudson Bay Zinc Company. The low-level No. 7 crosscut at the 3,100 level began in 1915 and reached a completed length of 579m in 1916. Drilling from the crosscut failed to find ore and the option was given up in 1917. All exploration work was done in the heavily oxidized zone at the north, and on No. 1 ore body where the flat-plunging ore was exposed on surface.

CMSC returned in 1927. From 1946, geological investigations led to an intensive drilling program that began in 1948. The drilling indicated large bodies of low-grade disseminated sulphides gently plunging south from the oxidized ore body. In 1951, construction of a 1,000 tonne per day concentrator began and the new No. 8 adit was driven 823m to the north from the Sheep Creek valley mill site to the ore zone.

David Minerals Ltd., by an agreement dated May 8, 1981, purchased the mine, mill, and adjacent properties from Cominco. The HB mill was renovated to include a flotation circuit to custom-mill gold- bearing sulphide ores, and a second circuit to treat molybdenite-gold ore from the company's Rossland properties. A gold circuit was put into operation for a short period in December 1981 to process ore from the Gold Belt property.

The HB ore bodies are thought to be Kootenay Arc-type carbonate-hosted sedimentary exhalative deposits. They are located within dolomitized limestone of the Reeves Member of the Lower Cambrian Laib Fm. The east boundary of the Laib Fm is in faulted contact with argillites of the Lower to Middle OA Fm. The OA rocks were thrust from the east over the Reeves rocks.

There are two distinct calcareous layers of the Reeves Member. The upper 110m thick unit is separated from a lower 12m thick member by 15 to 30m of micaceous brown limey argillite. Near the HB mine, the beds form a broad synclinorium. The limestone layers in the mine are on the west limb of this structure.

The HB ore bodies occur within a hundred meters or so to the west of the thrust fault. The mineralization may be related to granitic stocks of the Middle to Late Jurassic Nelson Intrusions, with the nearest outcropping about 1km away from the mine. The only intrusives present in the mine are post-ore dykes up to 3m thick.

The principal ore zones consisted of three steeply dipping, parallel zones extending as pencil-like shoots for about 900m along the gentle south plunge of the controlling structures. The largest, easternmost ore zone has a maximum height of about 140m and a maximum width of 30m. Steeply dipping discontinuous ore stringers with a Pb:Zn ratio of 1:5 occur with these zones. Evidence





indicates that ore deposition was controlled by shear zones within the folded limestone; with the best concentrations occurring at the junctions between steeply dipping shears (the pencil-like ore bodies) and flat lying shears (the flat-lying brecciated ore bodies).

The northern portion of these bodies, which is exposed at surface, near the original HB claim, is oxidized to a depth of 100m. The HB deposits were mined from underground; however, a smaller orebody southwest of the HB mine, known as the Garnet zone, was mined from a small open pit.

The mineralogy of the ore is relatively simple with pyrite, sphalerite, and galena, and with minor pyrrhotite locally.

The HB mine produced 6,656,101t of ore in 29 years between 1912 and 1978. The metals recovered included 29,425,521 g of Ag, 49,511,536 kg of Pb, 260,431,646 kg of Zn, 2,019,586 kg of Cd, 105,412 kg of Cu, and 6,159 g of Au. Measured and indicated reserves published December 31, 1978, by Canadian Pacific Ltd. were given as approximately 36,287t grading 0.1% Pb and 4.1% Zn (Energy, Mines and Resources Canada Mineral Bulletin MR 198, p. 209).

## 23.2 Molly (MINFILE 082FSW021)

The Molly molybdenum property is located at about 1219m elevation on the south side of Lost Creek, 12.8km south-southeast of Salmo. The Bromyrite King, Bromyrite, Molybdenite, and Molybdenum No.1 claims formed the property. In 1914, Molly was leased for to the Bell brothers of Salmo for six months, and molybdenum ore from open cuts and pits was shipped to Denver, Colorado. Early in 1915, B.C. Molybdenite Company Ltd. leased the property, and additional ore was shipped to Denver. In 1916, the property was under lease to International Molybdenum Company Ltd., which shipped about 90t of ore to their plant at Renfrew, Ontario. The original owners resumed work on the property in 1917 and shipped about 45t of ore to the Mines Branch, Ottawa.

The property was re-staked as the Molly and Molly 1-9 claims. The CMSC purchased the property in 1926 and followed with a small amount of underground work and diamond drilling the next year. The claims were Crown-granted to the company in 1930. The workings at that time included about 30m of drifts and crosscuts, an 18m raise, and a winze.

In 1942, Joe Gollow, of Howser, BC, discovered scheelite on the Molly 4 claim, about 305m southeast and 122m above the molybdenum showing. The company carried out considerable exploration for scheelite that same year. Further work by the company on the molybdenum showing during the period July 1942 to February 1943 included 35m of crosscut, 21m of drift, and a 5-m raise. A small tonnage of ore was mined, but not shipped.

The Molly mine is hosted the Lost Creek granite stock of the Middle to Late Jurassic Nelson Intrusions, which intruded a sequence of argillites and limy argillites of the OA Fm. The quartz-rich granite appears to have a 2m thick upper aplitic chilled zone or border capping. The aplite is sparsely impregnated with molybdenum.

The main molybdenum ore occurs below the capping within a zone about 3m thick, which contains numerous joints parallel to the intrusive contact. The best mineralization within this sheeted zone occurs where the intrusive contact dips at low angles and/or where there are prominent intersecting





fractures. Molybdenite occurs as selvages on the joint planes, or as disseminated specks between the joints. The massive granite below the sheeted zone hosts low concentrations of molybdenite. Tungsten, as scheelite, occurs locally disseminated in skarn zones of small size.

Records indicate that the Molly mine produced at least 171t of ore that carried 3.5 to 5.88% MoS<sub>2</sub>. From 1914 to 1917, 11,366 kg of molybdenum were produced. Minor pyrite, pyrrhotite, and uraninite are also associated with the deposit. A sample assayed 0.13% uranium equivalent (Geological Survey of Canada, Economic Geology #16).

## 23.3 Northeast Properties – Sheep Creek Mining Camp

Queen, Ore Hill, and Bonanza are a series of historic mines that produced silver, gold, lead, and zinc are located to the northeast of the Jersey-Emerald property as part of the Sheep Creek Mining Camp. The Summit mine (MINFILE 082FSW054), now included with the Apex claims, is also part of the historic Sheep Creek Mining Camp. The Sheep Creek Camp occupies a 5500 by 1600 ft (1700 by 500 meter) north trending area immediately east of the northeast side of the Jersey-Emerald Property. Generally, these quartz vein-hosted occurrences cut the Lower Cambrian Laib formation limestone and schist and are classed as Cretaceous aged orogenic gold deposits occurring on the east side of the Cretaceous intrusions that was responsible for the Jersey-Emerald mineralization.

The Sheep Creek Mining Camp consists of auriferous sulphide mineralization within a regional system of quartz veins controlled by faults. The camp hosts four distinct fault/fracture systems. All productive veins are associated with faults trending northeast and dipping southeast. Ore occurs in shoots and is almost without exception confined to parts of fault zones in which one or both walls are quartzite. The underlying Motherlode Member quartzite is, without obvious reason, almost completely barren of economic gold mineralization. The veins contain a quartz gangue containing pyrite with lesser amounts of pyrrhotite, chalcopyrite, galena, sphalerite, and rare visible gold. Precious metal grades are exceedingly variable and zones of high grade appear to be distributed randomly. Such zones or ore shoots are rarely greater than a few of tens meters in size.

#### 23.3.1 Queen (MINFILE 082FSW048)

This property is located on Waldie creek near its junction with Sheep Creek.

Leasers began development work on the Queen property in about 1900; the Holmes Syndicate carried on development work during part of 1902; the Queen claim (Lot 1076) was Crown-granted to Messrs. Turner and Scully that same year. In 1903 W. Waldie, one of the owners, began development of the property and obtained a lease on the Yellowstone mill. Waldie completed purchase of the property in 1905, acquired the Yellowstone group in 1907, and sold the combined property to Queen Mines Incorporated in 1908. The company operated the mine until 1916. Except for a brief period of operation by leasers in 1918 the property was idle until acquired by the Yellowstone Mining Company Limited in 1922, however, the company carried on operations for only about a year.

Messrs. Lavigne, Stayner & Associates acquired the property in 1928 and in 1930 formed Queen Mines Limited, however, operations ceased later in the year. In 1933 Sheep Creek Gold Mines Limited was formed by a consolidation of the Queen Mining & Milling Company and the Midnight Gold Mining Syndicate, owners of the Midnight and Vancouver claims. A new 50-ton mill was put into





operation in May 1935 and operated more or less continuously until the mine was closed in 1951. The company name was changed in 1956 to Sheep Creek Mines Limited.

Beginning in 1961 leasers made intermittent shipments of silica ore from the dumps, the ore being in demand as a silica flux. The company name was changed in September 1965 to Aetna Investment Corporation Ltd. During 2008 through 2016, Yellowstone Resources Ltd. examined the area as the Sheep Creek property. In late 2016, Margaux Resources Ltd. optioned the property and in 2017 examined the area.

Several ore shoots were developed on the Queen property which produced 653,165 tonnes of ore intermittently from 1902 to 1970. It has been reported that from 1900 to 1938 production was from the Queen vein; thereafter it includes production from other veins mined by Sheep Creek Gold Mines. From the total tonnage mined 9,453,383 grams of gold, 3,121,527 grams of silver, 7,769 kilograms of lead and 3,063 kilograms of zinc were recovered.

#### 23.3.2 Ore Hill (MINFILE 082FSW053)

The property is located at about 1585 meters elevation on Billings Creek, a northerly flowing tributary of Sheep Creek, and adjoins the Summit property to the southwest.

The showings were staked in 1901 and the Ore Hill claim (Lot 2073) was Crown-granted to G. Birtsch in 1903; other claims subsequently Crown-granted included the Dixie (Lot 10264), Ore Hill No. 3 (Lot 10265), Standard (Lot 10267), and Last-Dollar (Lot 10269). The property was acquired by G.G. Eitel & associates, of Minneapolis, and some development work was reported in 1906. Early work was done in open cuts and two adits on the west side of the creek. Later work was done in at least seven adits on the east side of the creek. A 7-ton-per-day stamp mill was installed in about 1914; the property was apparently under lease at that time to W.B. DeWitt & associates, lessors of the adjoining Summit property.

In 1917 C.H. Cassell, of Oranda, Washington, leased the property. Open cutting and about 27 meters of crosscut and drifting was carried out and some ore was milled in 1918. W.B. Poole & associates carried out some development work in the lower crosscut adit during 1919-20. In 1934 Joe Gallo optioned the property and an adit was begun on a new showing on the east side of the creek. Kootenay Ore Hill Gold Mines, Limited was incorporated in June 1936 to acquire the property from Mr. Gallo. During 1936-37 the adit begun by Mr. Gallo was extended with additional drifts and lower adit; some ore as stoped from the upper adit west drift. In October 1936 a 10-ton-per-day stamp mill was installed at the lower adit.

During 1938 the company leased the Ore Hill and Summit properties to H.D. Forman, who carried out mining and milling operations during the period February to May of that year. Sheep Creek Gold Mines, Limited, owner of the nearby Queen Mine, acquired the property from Kootenay Ore Hill Gold Mines and G. Birtsch in 1939. A 488-meter crosscut was driven from the Queen No. 5 level to Ore Hill ground. From this crosscut 85 meters of drifting, 404 meters of crosscutting, and 349 meters of diamond drilling was completed in 1940. A geological survey was reported by the company on Ore Hill ground in 1947.





The vein occurrence at the Ore Hill deposit crosscuts limestone and schist of the Lower Cambrian Laib Formation as well as quartzites and argillite of the Lower Cambrian Reno Formation (correlative with rocks of the Hamill Group). Several adits with over 1000 meters of underground development occur on the property.

Between 1906 and 1940, a total of 2,241 tonnes of ore were mined and 88,612 grams of gold, 168,424 grams of silver, 80,257 kilograms of lead and 75,651 kilograms of zinc were recovered.

#### 23.3.3 Bonanza (MINFILE 082FSW055)

The Bonanza property consists of several adits just north of McArthur Creek off Waldie Creek. Detailed information on the Bonanza vein system is limited. A mineralized vein strikes about 80 degrees and crosscuts quartzites of the Lower Cambrian Quartzite Range Formation near the westerly contact with the Lower Cambrian Reno Formation. Both formations are correlative with rocks of the Hamill Group. The quartzite is hard, white and the vein bifurcates with some brecciation between the branches but mostly on the northerly branch. Visible gold is reported in the quartz vein which may be over a meter wide locally but has very scarce disseminated sulphides. Minor limonite is reported.

The Bonanza North and South veins are developed by four adits on the Dip claim. About 17 tonnes were shipped in 1910 but the value of the shipment was not reported (Minister of Mines Annual Report 1910, page 110). In 1963, a total of 14 tonnes were mined, from which 124 grams of gold, 2,861 grams of silver and 118 kilograms of lead were recovered.





# 24.0 Other Relevant Data and Information

There is no other relevant data or information.





## 25.0 Interpretation and Conclusions

#### 25.1 Geology and Mineralization

- Knowledge of the deposit settings, lithologies, and structural controls on mineralization, and the mineralization style and setting are sufficient to support Mineral Resource estimation.
- Additional information on lithology, structure and alteration associated with mineralization would increase confidence in the mineral resource and potentially outline additional targets.

#### 25.2 Exploration and Drilling

- The exploration programs completed to date are appropriate to the style of the known mineralization within the Project area.
- A total of 5,109 drillholes have been drilled into the project area. A significant amount of drilling is historic, before 1994.

#### 25.3 Sample Preparation and Analysis

- Sampling methods are acceptable for resource estimation.
- The tungsten and molybdenum assays of blank material included in East Emerald would normally indicate potential significant contamination or other problems. Because the gold blank results are acceptable, these assay values are not in the range of interest for tungsten, and the blanks run by the labs themselves give acceptable results, it is presumed the blank material itself is not suitable for tungsten and the 2014-2017 assays are not rejected. The blank material is also clearly not appropriate for molybdenum.
- The 2014 drilling represents the majority of drilling in East Emerald, the gold CRMs used in this drilling are problematic. There are assays in 2014 drilling that appear to have been done by an incomplete assay method as indicated by low CRM results for all three elements evaluated. The 2017 drilling does not include CRMs certified for tungsten and molybdenum. The 2017 assays were done by aqua regia digestion, an incomplete method for tungsten. No tungsten CRMs were included in 2017, the analysis method reports a maximum of 200ppm, for which many intervals are reported, and no overlimits were done. There are 52 assays from 2017 in the database reported at 200ppm for which re-analysis may be indicated.
- The field duplicates have results for pairs much more different that would normally be expected, no sampling bias is observed, and the QP concludes that the mineralized zones are highly heterogenous.

#### 25.4 Data Verification

The QP concludes that the database is suitable for resource estimation. Certificate checks were made and any omissions or corrections to the data have been included in the interpolations in the resource areas. Data that did not include QAQC has been validated using Point Validation.





#### 25.5 Mineral Resource Estimate

The mineral resource has been estimated using ordinary kriging to estimate the Wo3, Mo, and Au grade throughout 21 interpreted mineralized domains of the Jersey-Emerald project. The estimate is constrained to "reasonable prospects of eventual economic extraction" shapes and has been validated by statistical comparisons with de-clustered composites and visual comparison.





# 26.0 Recommendations

The following recommendations are made to move the project forward.

## 26.1 Sample Preparation, Analysis, QAQC and Data Validation

- The database includes assays for all three elements tested by aqua regia digestion which are shown by CRM analysis to be significantly lower than expected. The affected holes, E1433, E1423 an E1435, are of importance to the resource estimate and an opportunity exists to reassay significant intervals with a possible increase in assay values.
- The database contains 54 assays from 2017 reported on certificates as ">200ppm" by aqua regia digestion and ICP and are represented as 200ppm in the database. Overlimits should be done on these assay intervals.
- Certified blank material be sourced and used for all future drilling at the Jersey-Emerald Project.
- Standard protocols call for two CRMs of different grades to be included in each batch of 40 samples. It is recommended that future drilling at this project include CRMs that meet this criteria for each element for which a resource estimate is anticipated.
- Check assays for gold are recommended for 2014 drilling due to the issues with the provisional standard that was used.
- Coarse preparation duplicates are normally included in the QAQC samples to assess the laboratory preparation stage. It is recommended that future drilling include coarse duplicates.
- A collar survey is recommended to remove any questions regarding drillhole locations that have been changed to reconcile with topography or errors induced during conversion from mine grid coordinates.
- For drilling outside of the resource area, there is a significant amount of assay values of metals that could be of interest that are not included in the resource database from both historic and non historic drilling. It is recommended a full review of the assay database be accomplished to take advantage of all existing data prior to further resource modeling.

#### 26.2 Exploration and Drilling

The QP recommends additional work to infill the Wo3 mineralized zones and potentially add to the Mo and Au zones. The recommended exploration program will include two phases with Phase 1 to upgrade the Classification of known zones. It is recommended that for potential remaining Pb-Zn mineralization, that the underground opening be re-surveyed, with follow-up re-assaying and drilling dependent on the result of the survey. The total recommended budget for these two phases of exploration is CDN\$1.2M as summarized in Table 25-1.

Phase	Item	Budget (\$CDN)			
	Diamond Drilling	\$ 700,000			
Phase 1	Historic Core Re-Assaying	\$ 50,000			
	Total - Phase 1	\$ 750,000			
	Re-survey of historic stopes and development	\$ 500,000			
Phase 2	Further Re-assaying of Pb-Zn if warranted	\$ 50,000			
	Total - Phase 2	\$ 550,000			
Total Budget Re	\$ 1,300,000				





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Title Number	Claim Name	Owner	Мар	Issue Date	Good To Date	Status	Area (ha)
233462		Apex (100%)	082F015	1986/SEP/22	2031/JAN/01	GOOD	25.00
233677		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
233693		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
233694		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
233695		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
233696		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
233697		Apex (100%)	082F015	1987/NOV/23	2028/JUN/30	GOOD	25.00
234582		Apex (100%)	082F014	1990/MAR/15	2031/JAN/20	GOOD	25.00
235311	COLD SUMMER	Apex (100%)	082F004	1964/SEP/04	2028/JUN/30	GOOD	25.00
311947	EVENING	Apex (100%)	082F004	1992/AUG/06	2028/JUN/30	GOOD	25.00
318816	JERSEY #4	Apex (100%)	082F014	1993/JUN/13	2031/JAN/20	GOOD	500.00
318817	JERSEY #2	Apex (100%)	082F014	1993/JUN/14	2031/JAN/20	GOOD	500.00
319025	JERSEY 1	Apex (100%)	082F014	1993/JUN/23	2031/JAN/20	GOOD	500.00
319026	JERSEY 3	Apex (100%)	082F014	1993/JUN/23	2031/JAN/20	GOOD	500.00
322324	BLUE JAY 1	Apex (100%)	082F004	1993/OCT/24	2029/JAN/20	GOOD	25.00
322325	BLUE JAY 2	Apex (100%)	082F004	1993/OCT/24	2029/JAN/20	GOOD	25.00
322326	BLUE JAY 3	Apex (100%)	082F004	1993/OCT/24	2029/JAN/20	GOOD	25.00
322327	BLUE JAY 4	Apex (100%)	082F004	1993/OCT/24	2030/JAN/20	GOOD	25.00
322328	BLUE JAY #5	Apex (100%)	082F004	1993/NOV/07	2030/JAN/20	GOOD	25.00
322329	BLUE JAY 6	Apex (100%)	082F004	1993/OCT/24	2029/JAN/20	GOOD	25.00
322859	LEROY 5	Apex (100%)	082F014	1993/NOV/20	2028/JUN/30	GOOD	25.00
322860	LEROY 6	Apex (100%)	082F014	1993/NOV/20	2028/JUN/30	GOOD	25.00
322861	LEROY 7	Apex (100%)	082F014	1993/NOV/20	2028/JUN/30	GOOD	25.00
322862	LEROY 8	Apex (100%)	082F014	1993/NOV/20	2028/JUN/30	GOOD	25.00
324439	LOST GOLD	Apex (100%)	082F004	1994/MAR/19	2029/JAN/20	GOOD	225.00
325259	MV 1	Apex (100%)	082F004	1994/APR/23	2029/JAN/20	GOOD	25.00
325260	MV 2	Apex (100%)	082F004	1994/APR/23	2029/JAN/20	GOOD	25.00
325261	MV 3	Apex (100%)	082F004	1994/APR/23	2028/JUN/30	GOOD	25.00
325262	MV 4	Apex (100%)	082F004	1994/APR/24	2030/JAN/20	GOOD	25.00
325269	JERSEY 5	Apex (100%)	082F004	1994/APR/24	2030/JAN/20	GOOD	500.00
325270	JERSEY 6	Apex (100%)	082F004	1994/MAY/01	2030/JAN/20	GOOD	300.00
329070	POSIE 1	Apex (100%)	082F004	1994/JUL/25	2029/JAN/20	GOOD	500.00
330364	LEROY 9	Apex (100%)	082F014	1994/AUG/28	2028/JUN/30	GOOD	25.00
330365	LEROY 10	Apex (100%)	082F014	1994/AUG/28	2028/JUN/30	GOOD	25.00
330366	LEROY NORTH 1	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330367	LEROY NORTH 2	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330368	LEROY NORTH 3	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330369	LEROY NORTH 4	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330370	LEROY NORTH 5	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330371	LEROY NORTH 6	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330372	LEROY NORTH 7	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
330373	LEROY NORTH 8	Apex (100%)	082F014	1994/AUG/21	2028/JUN/30	GOOD	25.00
331985	HANGOVER	Apex (100%)	082F004	1994/OCT/22	2029/JAN/20	GOOD	25.00
331986	GULLY	Apex (100%)	082F004	1994/OCT/22	2029/JAN/20	GOOD	25.00
342202	JERSEY #7	Apex (100%)	082F015	1995/NOV/22	2031/JAN/01	GOOD	500.00
342203	JERSEY #8	Apex (100%)	082F015	1995/NOV/22	2031/JAN/01	GOOD	400.00
347849	SUMIT 1	Apex (100%)	082F015	1996/JUN/30	2031/JAN/01	GOOD	25.00

# APPENDIX A Listing of Claims and Crown Grants





Title Number	Claim Name	Owner	Мар	Issue Date	Good To Date	Status	Area (ha)
347850	SUMIT 2	Apex (100%)	082F015	1996/JUN/30	2031/JAN/01	GOOD	25.00
347851	SUMIT 3	Apex (100%)	082F015	1996/JUN/30	2031/JAN/01	GOOD	25.00
347852	SUMIT 4	Apex (100%)	082F015	1996/JUN/30	2031/JAN/01	GOOD	25.00
348168	J1	Apex (100%)	082F015	1996/JUL/18	2028/JUN/30	GOOD	25.00
348169	J2	Apex (100%)	082F015	1996/JUL/18	2028/JUN/30	GOOD	25.00
348170	J3	Apex (100%)	082F015	1996/JUL/18	2028/JUN/30	GOOD	25.00
348171	J4	Apex (100%)	082F015	1996/JUL/18	2028/JUN/30	GOOD	25.00
348172	J5	Apex (100%)	082F014	1996/JUL/18	2028/JUN/30	GOOD	25.00
348173	J6	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348174	J7	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348175	J8	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348176	19	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348177	J10	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348178	J11	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348179	J12	Apex (100%)	082F015	1996/JUL/13	2029/JAN/01	GOOD	25.00
348180	JERSEY 9	Apex (100%)	082F015	1996/JUL/12	2029/JAN/01	GOOD	400.00
348181	JERSEY 10	Apex (100%)	082F015	1996/JUL/17	2030/JAN/01	GOOD	500.00
348182	JERSEY 11	Apex (100%)	082F015	1996/JUL/17	2030/JAN/01	GOOD	500.00
348183	JERSEY 12	Apex (100%)	082F015	1996/JUL/16	2028/JUN/30	GOOD	450.00
349449	J-13	Apex (100%)	082F004	1996/AUG/05	2029/JAN/20	GOOD	25.00
349450	J-14	Apex (100%)	082F004	1996/AUG/05	2029/JAN/20	GOOD	25.00
349451	J-15	Apex (100%)	082F004	1996/AUG/05	2029/JAN/20	GOOD	25.00
349452	J-16	Apex (100%)	082F004	1996/AUG/05	2029/JAN/20	GOOD	25.00
349453	J-17	Apex (100%)	082F004	1996/AUG/05	2029/JAN/20	GOOD	25.00
349901	JERSEY 13	Apex (100%)	082F015	1996/AUG/23	2031/JAN/01	GOOD	450.00
349902	JERSEY 14	Apex (100%)	082F015	1996/AUG/23	2031/JAN/01	GOOD	450.00
349903	J 18	Apex (100%)	082F015	1996/AUG/20	2031/JAN/01	GOOD	25.00
349904	J 19	Apex (100%)	082F015	1996/AUG/20	2029/JAN/01	GOOD	25.00
349905	J 20	Apex (100%)	082F015	1996/AUG/20	2031/JAN/01	GOOD	25.00
349906	J 21	Apex (100%)	082F015	1996/AUG/20	2031/JAN/01	GOOD	25.00
349907	J 22	Apex (100%)	082F015	1996/AUG/20	2031/JAN/01	GOOD	25.00
349908	J 23	Apex (100%)	082F015	1996/AUG/20	2031/JAN/01	GOOD	25.00
518176	ART 1	Apex (100%)	082F	2005/JUL/22	2029/JAN/01	GOOD	84.54
548440	ASP	Apex (100%)	082F	2007/JAN/02	2029/JAN/01	GOOD	42.22
548464	ASP	Apex (100%)	082F	2007/JAN/02	2030/JAN/01	GOOD	253.41
548465	ASPEN 2	Apex (100%)	082F	2007/JAN/02	2030/JAN/01	GOOD	21.11
548466	ASP	Apex (100%)	082F	2007/JAN/02	2029/JAN/01	GOOD	21.11
548467	ASPEN 3	Apex (100%)	082F	2007/JAN/02	2029/JAN/01	GOOD	105.54
550768	SULTAN	Apex (100%)	082F	2007/JAN/31	2030/JAN/01	GOOD	528.70
550769	SULTAN2	Apex (100%)	082F	2007/JAN/31	2030/JAN/01	GOOD	296.17
602733	SPURLIN 1	Apex (100%)	082F	2009/APR/16	2024/JAN/01	GOOD	381.33
603544	SPURLIN 2	Apex (100%)	082F	2009/APR/28	2024/JAN/01	GOOD	296.56
603742	MAY 1	Apex (100%)	082F	2009/MAY/01	2030/JAN/01	GOOD	296.30
604337	JASON 1	Apex (100%)	082F	2009/MAY/11	2029/JAN/01	GOOD	232.92
604347	JASON 4	Apex (100%)	082F	2009/MAY/11	2029/JAN/01	GOOD	402.25
604358	JASON 10	Apex (100%)	082F	2009/MAY/11	2024/JAN/01	GOOD	423.77
604359	JASON 11	Apex (100%)	082F	2009/MAY/11	2024/JAN/01	GOOD	339.04
604385	JASON 12	Apex (100%)	082F	2009/MAY/12	2024/JAN/01	GOOD	84.73
604676	FAYE 1	Apex (100%)	082F	2009/MAY/19	2029/JAN/01	GOOD	337.64





Title Number	Claim Name	Owner	Мар	Issue Date	Good To Date	Status	Area (ha)
604677	FAYE 2	Apex (100%)	082F	2009/MAY/19	2024/JAN/01	GOOD	421.98
604678	FAYE 3	Apex (100%)	082F	2009/MAY/19	2024/JAN/01	GOOD	464.20
604689	HIDDEN ASPEN	Apex (100%)	082F	2009/MAY/19	2029/JAN/01	GOOD	189.94
665745	ASPEN 4	Apex (100%)	082F	2009/NOV/06	2029/JAN/01	GOOD	42.24
704936	POSIE 2	Apex (100%)	082F	2010/JAN/28	2024/JAN/01	GOOD	211.71
704937		Apex (100%)	082F	2010/JAN/28	2024/JAN/01	GOOD	338.81
708062		Apex (100%)	082F	2010/FEB/26	2029/JAN/01	GOOD	42.25
1023803	ASPENEX	Apex (100%)	082F	2013/NOV/13	2030/JAN/01	GOOD	84.45
1030297	ZINC1	Apex (100%)	082F	2014/AUG/15	2025/JAN/01	GOOD	148.19
1030298	ZINC2	Apex (100%)	082F	2014/AUG/15	2024/JAN/01	GOOD	127.08
1030299	ZINC3	Apex (100%)	082F	2014/AUG/15	2031/JAN/01	GOOD	42.33
1030300	ZINC4	Apex (100%)	082F	2014/AUG/15	2031/JAN/01	GOOD	148.27
1049148		Apex (100%)	082F	2017/JAN/13	2031/JAN/01	GOOD	105.85
1049149		Apex (100%)	082F	2017/JAN/13	2031/JAN/01	GOOD	169.34
1049150		Apex (100%)	082F	2017/JAN/13	2031/JAN/01	GOOD	148.13
1049151		Apex (100%)	082F	2017/JAN/13	2031/JAN/01	GOOD	105.79
1050228	ROADSIDE	Apex (100%)	082F	2017/FEB/22	2024/JAN/20	GOOD	21.16
1050485	HEDGEHOG	Apex (100%)	082F	2017/MAR/01	2030/JAN/01	GOOD	359.25
1050735	MUT	Apex (100%)	082F	2017/MAR/14	2031/JAN/01	GOOD	507.83
1051262	SUMIT FR	Apex (100%)	082F	2017/APR/06	2031/JAN/01	GOOD	21.14
1051488	JERSEY SOUTH FR	Apex (100%)	082F	2017/APR/19	2031/JAN/20	GOOD	63.47
1055098	JERSEY TAILS	Apex (100%)	082F	2017/SEP/22	2025/JAN/01	GOOD	42.29
1059815	JT 2	Apex (100%)	082F	2018/APR/05	2025/JAN/01	GOOD	190.31
1061529	ASPEN FR	Apex (100%)	082F	2018/JUL/03	2031/JAN/01	GOOD	42.23
<b>Total Claims</b>	120					Total	16935.56





Crown Grant Tenure	Name	Area (ha)			
L15091	ALFIE	20.90			
L14882	BIG DICK	18.79			
L12686	BONCHER	20.90			
L14890	BRUCE (FR)	1.62			
L14763	CALCITE	9.43			
L14761	COMET	14.42			
L14762	CONTACT	14.86			
L14904	COPPERFIELD	16.61			
L15041	DEN #1 (FR)	20.89			
L15040	DEN (FR)	13.74			
L12083	DODGER	19.54			
L9073	EMERAL	20.90			
L9074	EMERALD (FR)	16.89			
L9071	GOLD STD	20.90			
L15020	HAL NO. 1	20.51			
L15021	HAL NO. 2	20.52			
L14881	HILLSIDE	14.04			
L9070	JERSEY	17.82			
L12688	JUMBO 2	18.32			
L3369	KIN SOLOMAN	8.48			
L3368	KING ALFRED	19.27			
L12116	LAST CHANCE	20.02			
L12117	MARK TAPLEY	18.73			
L1070	MASTADON	20.90			
L9075	MORNING	8.94			
L1071	NELLIE J	20.90			
L12087	PICKWICK	18.49			
L14889	REX (FR)	4.16			
L12115	ROYAL (CDN)	15.97			
L14765	SCOTT (FR)	16.49			
L14764	STAN (FR)	1.45			
L9072	STANDARD (FR)	5.56			
L9076	SUNSHINE	18.79			
L15033	SUNSHINE NO.2	13.97			
L14888	VICTOR (FR)	15.48			
L15092	W KING	15.87			
L15094	W KING #1	17.18			
L14766	W KING #1 (FR)	18.28			
L15093	W KING #2	3.83			
L15095	W KING #3	11.49			
L15096	W KING #4	10.14			
L15097	W KING #5	9.16			
L15098	W KING #7	18.66			
L15099	W KING #8 (FR)	6.75			
Total Crown Grants		44			
Total Area(ha) 660.56					
FR= FRACTION. STD=STANDARD. CDN=CANADIAN. W=TUNGSTFN					