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## NI 43-101 TECHNICAL REPORT, GEOLOGICAL INTRODUCTION TO KNAPDALE GOLD-SILVER PROJECT, SCOTLAND



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## 1 Summary

### 1.1 Issuer and Purpose

This Technical Report has been prepared for the issuer, Cassowary Capital Corporation Ltd. (Cassowary) (a TSX Venture Exchange listed "capital pool company"), by APEX Geoscience Ltd. and Lakehead Geological Services Inc. The Technical Report trigger is a reverse takeover transaction (Transaction) in which Cassowary acquires Western Gold Exploration Ltd. (WGE). By way of this commerce, Cassowary takes over Lorne Resources Ltd. (Lorne Resources), a wholly owned subsidiary of WGE. As a result, Cassowary becomes the beneficiary of the Lorne Resources Prospecting Agreements and associated 2014-2018 exploration work at the Knapdale Gold-Silver Project in southwestern Scotland. All future references to Cassowary 's interest in the Prospecting Agreements, the Knapdale Property or related data is a reference to Cassowary's ownership interest in the same held through its subsidiaries, upon completion of the Transaction.

The intent of this Technical Report is to provide: 1) a geological introduction to the Knapdale Property as Cassowary's qualifying, flagship property; 2) sufficient evidence of no less than CDN\$100,000 of exploration expenditures on the qualifying property in the last 3 years via Lorne Resources; and 3) recommendations for future exploration work programs.

The Technical Report was prepared in accordance with the Canadian Securities Administration's National Instrument 43-101. The effective date of this report is 12 June 2020.

## 1.2 Authors

The authors of this Technical Report are Mr. Roy Eccles M.Sc. P. Geol. of APEX Geoscience Ltd. and Mr. Douglas Turnbull B.Sc. (Hons) P. Geo. of Lakehead Geological Services Inc. The authors are independent of Cassowary and WGE and are Qualified Persons as defined by National Instrument 43-101. Mr. Eccles takes overall responsibility for the preparation and publication of the Technical Report.

Mr. Eccles has worked continuously as a geologist for more than 30 years since his graduation from University and has been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta ("APEGA"; Membership Number 74150) since 2003. Work experience includes orogenic gold and multiple commodity projects within Laurentian Caledonian orogenic tectonic events associated with the development and closure of the lapetus Ocean.

Mr. Turnbull is a consulting geologist with over 30 years' experience in diamond, precious and base metal exploration beyond his University degree. He holds an Honours Bachelor of Science degree in Geology and is a Qualified Professional Geoscientist



recognized by the Engineers and Geoscientists of British Columbia since 1992 (License #19959).

### 1.3 Property Location and Description

The Knapdale Property is in the parish of Knapdale, and more specifically in the parish of Knapdale South in the district and county of Argyll near the Village of Tarbert, Argyll, Scotland. The Property is approximately 70 km west of the City of Glasgow and 50 km south of Town of Oban in the uplands of the west coast of Scotland.

The Knapdale Gold-Silver Project is an early exploration stage project that comprises three contiguous sub-properties (Stronchullin, Ormsary North and Ormsary South) that total 3,253 ha. Prospecting Agreements to work on these sub-properties were originally acquired by Lorne Resources and include a Crown Charter 1907 rights to gold and silver at Stronchullin and Ormsary North sub-properties. The exclusive Prospecting Agreements are now 100% owned and operated by WGE (through its subsidiary Lorne Resources) with option to lease (if exercised, giving right to mine and surface access).

The Ormsary South sub-property Prospecting Agreements include surface access rights and base metal mining rights agreements. Mining rights to gold and silver at Ormsary South are owned by the Crown.

The Stronchullin and Ormsary North sub-properties Prospecting Agreement include surface access rights, and base metal and gold and silver mining rights agreements. Gold and silver are included in these agreements because these sub-properties are subject to the Crown Charter 1907 thus consolidating ownership of minerals and land.

The landowners have granted exclusive surface access to Lorne Resources, for up to 15 years from 2018. Work commitments of £1.5 million before 29 July 2022 and £3 million in total before 29 July 2024. Prospecting Agreements may be terminated by landowners if the work commitment is not met. The option period under the Prospecting Agreements expires on 28 January 2033.

## 1.4 Royalties

Annual option fee schedules to each of Ormsary and Stronchullin owners is currently  $\pounds$ 5,000 index linked since 2018, rising to  $\pounds$ 10,000 index linked in 2023 and  $\pounds$ 15000 index linked in 2028. If leases are acquired, each landowner is paid rent of  $\pounds$ 40,000 per annum, index linked and a royalty of 2% net realisable value on all base metals and 1.5% net realisable value of gold and silver, plus a share of any saving in royalty payable to the Crown for gold and silver. Royalty is payable to the Crown on all gold and silver extracted. This is likely to be 4% of net realisable value.



## 1.5 Permitting

To date, WGE has not applied for any work permits. Mineral planning and decisions on planning applications are a responsibility of a local authority body designated as the Mineral Planning Authority. Minerals extraction may only take place if the operator has the agreement of the landowner and has obtained both a planning permission from the Mineral Planning Authority and any other permits and approvals.

## 1.6 Environmental and Property-Related Uncertainties

No residual environmental liabilities are known or expected within the Knapdale Property.

Two wind farms are present within the Ormsary North and Stronchullin sub-properties. An agreement with wind farm operators may be required to regulate the wind farm operators' current rights to not have their operations materially or adversely affected.

The Ormsary South sub-property in the Knapdale Project falls within a granted and current Lease Option belonging to Scotgold Resources Ltd. The landowner has granted exclusive surface access to Lorne Resources, for up to 15 years from 2018 (i.e., to 28 January 2033). The landowner has granted exclusive surface access to Lorne Resources for up to 15 years from 2018 (i.e., to 28 January 2033) over the Ormsary South sub-property. The Crown grant to Scotgold, however, does not affect gold-silver exploration at the Knapdale project (other than the Ormsary South sub-property) because any such exploration will be subject to the Crown Charter 1907.

## 1.7 Regional Geology

The Knapdale Project is situated within the mid-Neoproterozoic to Early Palaeozoic Dalradian Supergroup, which is comprised of largely clastic sedimentary rocks with notable carbonate and volcanic units. The entire Dalradian rock package has been deformed and metamorphosed to varying degrees during the mid-Ordovician Grampian event of the Caledonian Orogeny. The Dalradian Supergroup is divided into lower Cryogenian Grampian and Appin groups and two higher Ediacaran to Middle Cambrian groups known as the Argyll and Southern Highland groups. The Argyll Group, which is the focus of this Technical Report, is subdivided from stratigraphic base to top by the Easdale, Crinan and Tayvallich subgroups.

The bedrock geology in the Knapdale Property comprises middle Argyll Group rock sequences of the Easdale and Crinan subgroups that form the apex of the Ardrishaig Anticline. At Knapdale and on the southeastern limb of the Ardrishaig Anticline, the diachronous, Lower Erins Quartzite replaces the upper part of the Ardrishaig Phyllite (both units of the Easdale Subgroup), which in turn is overlain by the Upper Erins Quartzite (Crinan Subgroup). The Lower and Upper Erins Quartzite formations represent a critical stratigraphic boundary within the anticline as the two units are separated by the Stronchullin Phyllite (Easdale Subgroup). The stratigraphy is inverted and generally dips



moderately 40° to 60° to the northwest. The interaction of these rheological contrasting rock types, together with structurally complex strata, form a high-strain zone for the development of quartz veins that crop out at several locations within the Knapdale Property.

#### 1.8 Mineralisation

The mineralisation at the Knapdale Project occurs in deposit types characterized as orogenic vein-type mineralisation and stratiform sulphide-type mineralisation. The structurally controlled orogenic quartz veins comprise either single veins with considerable vertical and strike continuity or occur as zones of stringers/veinlets and as possible suites of en-echelon veins of more limited extent. Vein-style gold mineralisation is typified in the Knapdale Property at the Stronchullin and Allt Dearg prospects (Stronchullin and Ormsary North sub-properties).

Bedrock exposures of mineralised quartz veins are generally extensively leached with only minor visible sulphide and the development of limonite coated vughs after weathered sulphides. The auriferous quartz veins contain approximately 2-3% sulphide but vary locally from being barren to having more than 10% modal sulphide abundance. Sulphide abundance and types vary from prospect to prospect within the Knapdale Property, but generally, the most common sulphides include pyrite, galena and chalcopyrite. Chalcopyrite is dominant at Allt Dearg prospect with some samples having >10% Cu. Sphalerite is restricted to the vicinity of the old Stronchullin mine. Pyrite is very abundant in the southern portions of the Stronchullin vein system being the dominant sulphide with minor chalcopyrite and galena and is related to the highest reported grade 230 g/t Au in sample RC844459. The Au-Ag-Cu mineralisation is characterized by high levels of lead, zinc, arsenic and antimony with elevated gold/silver ratios. Bismuth is characteristic of Allt Dearg prospect and southern part of Stronchullin vein.

The auriferous veins can exhibit considerable variation in grade along strike and in the sub-surface and are believed to record a complex history of repeated fluid mobilization along the ore-controlling structures that result in multiple phases of brecciation, recrystallisation and veining. The gold-silver quartz veins occur within upper greenschist facies conditions during the Grampian event of the Caledonian Orogeny and are outboard of the garnet isograd and structurally overlie the pyrite horizon.

Stratiform, disseminated pyrite mineralisation, such as at Gossan Burn (Ormsary North sub-property), typically comprise copper mineralisation (plus cobalt and silver and minor lead-zinc) in intensely hematite-silica-altered sericite schist host rocks with chalcocite, chalcopyrite, malachite, and very rare azurite (locally chalcanthite after chalcocite). At Meall Mór–Abhainn Strathainn, the Erins Quartzite Formation, comprises a pyritic zone with coarse, blebby chalcopyrite and other sulphide.

Low to medium grade gold enrichment has been identified in association with discordant copper vein mineralisation in the Meall Mór area, in the vicinity of the former



mine workings at Abhainn Strathainn. The mineralisation is distinguished by high contents of copper, barium, zinc and silver and low levels of arsenic, antimony, bismuth, and lead.

#### 1.9 Historical Exploration (Not Within the Knapdale Property)

The Qualified Persons have been unable to verify the specific mineral deposit and resource information for mines/deposits that occur outside of the Knapdale Property, and therefore, the information is not necessarily indicative to the mineralisation on the Knapdale Property that is the subject of the Technical Report.

Examples of advanced to actively producing gold deposits in orogenic structurally controlled, mesothermal gold-bearing quartz and quartz-sulphide vein systems in Dalradian metasedimentary rocks include the Curraghinalt and Omagh deposits in Northern Ireland. These mines and deposits have historical or current (2014-2018) gold resource estimations and are either actively producing or are considered advanced exploration projects.

Copper dominant base metal sulphide mineralisation has been documented in the south Knapdale Meall Mór around the catchment of Abhainn Srathain and represents one of the larger areas of historical mineral workings. Directly southwest of the Ormsary North sub-property, the Abhainn Srathain deposit was exploited at the end of the 18<sup>th</sup> century and mid-19<sup>th</sup> century, and consists of stratiform and discordant copper-rich veins and local chalcopyrite enrichment within a zone of stratiform sulphide mineralisation, or pyritiferous schist, known as the 'pyrite zone' in Dalradian Supergroup metasedimentary rocks (Argyll Group; Upper Erins Quartzite Formation).

#### 1.10 Historical Exploration (Within the Knapdale Property)

The Knapdale Project area contains five known historic occurrences/deposits, some of which have undergone small-scale historical exploitation of copper and lead with minor production of silver. The historical exploitation focused mainly on surface-exposed quartz veins, but locally, more extensive underground workings include shallow adits and shafts. Some of the historical mine workings in the Knapdale Property area (e.g., Stronchullin) date back to the late 1790s when the area was accessibly only by sea.

The modern era of historical exploration benefited from the work of Noranda-Kerr Ltd.'s 1972 geochemical surveys in vicinity of Abhainn Strathainn copper mine and two British Geological Survey Mineral Reconnaissance Program reports that documented the mineral potential of the Knapdale Property (published in 1978 and 1996). The Survey work includes mineral occurrence and deposit information, deposit models, regional geochemical drainage (stream sediment and panned concentrate samples), lithogeochemical and mineralogical rock studies, ground geophysical surveys and lineation analysis.

The Government Survey reports documented that the highest gold mineralisation within the Knapdale Property occurs at the historic Stronchullin Mine dumps with rock



grab samples up to 22 ppm gold. The Stronchullin mineralisation was associated with high arsenic, antimony, copper, lead, zinc, barium, and elevated gold/silver ratios. In addition to gold, copper mineralisation was documented at Gossan Burn, which is located within the Knapdale Property approximately 2 km north of Abhainn Strathainn.

#### 1.11 Exploration

WGE has acquired the rights to all data associated with Lorne Resources 2014-2018 exploration programs at the Knapdale Property. The exploration work and database detail multiple deep till/soil, stream-sediment, panned concentrate, rock grab and trench rock sample surveys (n=1,059 total samples), a water monitoring program and a 2017-2018 drill program that drilled 10 drillholes. Collectively, the drill program intersected and cored a total of 1,216.0 m that include 751.5 m at the Stronchullin and 464.5 m at the Ormsary North sub-properties (Stronchullin and Allt Dearg prospects, respectively).

In this Technical Report, the authors have separated the Lorne Resources exploration work into 2014-2016 and 2017-2018 work programs to provide evidence of CDN\$100K of exploration work over the last 3-years. Based on the 2014-2016 exploration work, the strongest gold mineralisation occurs in the northern portion of Property at Stronchullin and Allt Dearg as defined by strong multi-element chalcophile element associations. At Stronchullin, a panned concentrate sample PC843452 from the Gleann da Leirg stream yielded: 4 grains of visible gold, 86.2 ppm Au, 16.2 ppm Ag, 96.9 ppm As, 5.7 ppm Bi, 13.1 ppm Sb, 0.26 ppm W and 1.1 ppm Hg. The Au-Ag-As-Bi-Sb anomaly covers an area of approximately 15 km<sup>2</sup>. Rock samples from the Stronchullin mine dumps yielded up to 66.4 g/t Au and 17.9 ppm Ag (sample RC843133) from a massive white, coarse crystalline quartz vein with silica-sericite altered schist slivers, <5% galena, <10% sphalerite, <1% disseminated chalcopyrite and arsenopyrite, and <1% pyrite.

At Allt Dearg, 2 panned concentrate samples contained visible gold and >10% sulphide. Panned concentrate samples PC843396 yielded: 57.1 ppm Au, 26.2 ppm Ag, 40.3 ppm As, 19.8 ppm Bi, 6.9 ppm Sb, 0.26 ppm W and 0.9 ppm Hg. Rock chip sampling of new road cuttings west of the Allt Dearg stream yielded anomalous values of Au-Ag-Cu-Pb-Zn-As from swarms of narrow (<0.5 m) quartz-sulphide veinlets. The veins occur in psammite and are accompanied by sericite-silica alteration and approximately 10%-15% sulphide mineralisation.

The Gossan Burn prospect is characterized by a well-defined base of till (top of bedrock) anomaly with gold values between 63-134 ppb Au and up to 584 ppb Au. Copper mineralisation is evident in intensely hematite-silica-altered sericite schist host rocks with chalcocite, chalcopyrite, malachite and rare azurite. Two rock grab samples yielded: 40% Cu and 18.8 g/t Ag; and 27.7% Cu, 14.4 g/t Ag.

The 2017-2018 exploration work includes geochemical surveys (stream sediment panned concentrate, rock grab and trench channel samples) and a 10-hole drill program. A single panned concentrate sample collected approximately 650 m due east of the historic Stronchullin mine workings yielded 1,190 ppb Au. Assay highlights from the



prospecting rock chip sampling program (n=65 samples) include a sample with up to 230 ppm Au and 181 ppm Ag, another sample with 7,410 ppm Cu and demonstrated anomalous gold values approximately 1 km south-southwest of the historic Stronchullin gold mine. At Stronchullin, trench channel samples yielded analytical results of 257 ppb Au and 0.16 ppb Ag, and 217 ppb Au and 0.2 ppb Ag.

Drill core sampling averaged 1 m intervals and was selectively focused on obvious sulphide-bearing quartz veining and directly adjacent wall rock where alteration was visible (mostly silicification, sericite, chlorite, and carbonate). A total of 261 core samples were collected for assaying. The reported mineralised intervals represent down hole measurements are not estimated true widths. The general vein system strikes roughly north-south and dips 70°-80° to the west. Drilling was oriented and inclined such that veins were intersected at angles ranging from 45° to 60° to core axis. Additional geotechnical work is required to determine true widths of the assay values.

At Stronchullin (n= 189 core samples), 9 samples returned gold grades over 2.5 g/t Au and 6 samples returned grades greater than 5 g/t Au. Selected assay results (down hole widths) include:

- Drillhole SD17-1: 13.70 g/t Au and 5.21 g/t Ag over 0.50 m.
- Drillhole SD17-2: 13.30 g/t Au and 32.00 g/t Au over 1.05 m.
- Drillhole SD17-3: 41.80 g/t Au and 262.00 g/t Ag over 0.55 m.
- Drillhole SE17-6: 9.52 g/t Au and 3.86 g/t Ag over 0.90 m.

All high-grade gold and silver intervals were associated with sulphide-bearing quartz veins. Other highlights include:

- Hole SD17-2 intersected a quartz-sulphide stringer zone toward the end of the drillhole that may indicate additional mineralisation at further depths in host rocks within the favourable Upper Erins Quartzite Formation strata.
- Hole SD17-3 intersected a strongly developed main quartz-sulphide lode hosted by the Upper Erins Quartzite Formation with a high-grade quartz-chalcopyritepyrite vein encountered at approximately 3 m into the footwall. The veins diminish within the underlying Stronchullin Phyllite Formation but may potentially redevelop within Upper Erins Quartzite Formation at depth.

With respect to the Ormsary drill program, due to snow cover on steep slopes, the drilling program was limited to 3 drillholes (of the 6 proposed) on second priority targets. That is, the historic copper-silver-gold mine at Allt Dearg East could not be safely accessed during this program.



## 1.12 Metallurgy

WGE initiated a Micro X-ray Fluorescence spectroscopy study on high-grade mineralisation at Stronchullin (sample RC844459). The mineralogical mapping and twodimensional elemental maps provide detailed information about the spatial variation of sulphide and concentration of major and minor elements within the sample.

The sulphide phase was identified to be predominantly pyrite with galena and small areas of chalcopyrite. The largest gold grain observed by the XRF scan is 600 microns (0.6 mm) and the bulk of the grains are <100 microns in size. Silver is strongly associated with the gold as electrum grains and gold has an unequivocal correlation within the sulphide phase, which is dominantly pyrite.

## 1.13 Adequacy of the Data

The Qualified Persons have reviewed the adequacy of the exploration information and the visual, physical, and geological characteristics of the property and has found no significant issues or inconsistencies that would cause one to question the validity of the data. The Qualified Persons are satisfied to include the exploration data including geochemical surveys and drill information in this geological introduction Technical Report. It is the authors opinion that WGE (via Lorne Resources) has completed more than CDN\$100,000 of exploration work over the last 3-years.

## 1.14 Qualified Professional Site Inspection

Mr. Turnbull completed a Qualified Person site inspection at the Knapdale Property on February 5-7<sup>th</sup>, 2020. The site visit included: a geological review of the Upper Erins Quartzite and the Stronchullin Phyllite formations; a field inspection of the Stronchullin gold prospect and the northern end of the Allt Dearg target area; and a review of 2017-2018 drill core from drillholes SD17-1,2,3,4 and 6 (Stronchullin) and OD17-1 (Allt Dearg). A total of 8 bedrock and float grab samples were collected for geochemical analysis at an independent laboratory to confirm the mineralisation potential at the Knapdale Au-Ag Project.

The QP samples unequivocally demonstrate the Au-Ag and base metal potential of the Stronchullin prospect from an independent perspective. Samples from the waste dump at the historic Stronchullin Mine (GB-ST-03 and BDG-GB-ST-08, of sulphide-bearing quartz veins with micaceous wall rock, yield elevated Au-Ag (7.7 to 9.9 ppm Au and 1.6 to 2.3 ppm Ag) and associated hydrothermal fluid pathfinder elements (As, Ba, Sb, Te and W). These samples also have elevated base metal elements that include: 288 and 956 ppm Cu, 610 and 766 ppm Pb and 3,410 and 6,270 ppm Zn.

## 1.15 Concluding Qualified Persons Statement

The Knapdale Au-Ag Project is considered prospective for the discovery of orogenic style gold mineralisation and stratabound massive sulphide deposits. The Au-Ag (and Cu)



mineralisation is hosted within the Neoproterozoic Dalradian Supergroup metasedimentary rocks and associated with Caledonide orogenesis tectonostructural events.

The Knapdale Property and geology has several observed characteristics that appear to be important controls on the development of the gold-silver mineralisation in the southwest Grampian Highlands of Scotland as follows:

- Auriferous quartz lodes are generally hosted by Neo-Proterozoic Dalradian Supergroup metasedimentary rocks with host rocks associated with Argyll Group Easdale and Crinan subgroups.
- Competency contrasts at the boundary between the phyllite and schist of the Easdale Subgoup and stratigraphically overlying but structurally underlying Crinan Subgroup quartzite marks a favourable zone for quartz vein development.
- The quartz lodes are developed within the inverted southeast limb of the recumbent D1-D2 Ardrishaig Anticline where secondary D3-D4 fold structures such as the Tarbert monoform are superposed on the earlier fold structures.
- The interaction of these rheological contrasting rock types, together with structurally complex steeply dipping strata, form a high-strain zone for the emplacement of mineralised quartz veins that crop out at several locations within the Knapdale Property.
- The auriferous quartz veins are situated within metasedimentary rocks of upper greenschist metamorphic grade and the strata are situated between the biotite and garnet metamorphic isograds.
- Reducing rocks such as the Stronchullin Phyllite and St Catherine's Black Shale units within the Easdale Subgroup may be create favourable redox environments for the precipitation of metals mobilized during repeated structural events.

The Dalradian Argyll Group lithologies in the southwestern Scotland and Northern Ireland are known to host occurrences that may be classified as orogenic gold-bearing vein, Besshi style massive sulphide and sedimentary-exhalative style deposits.

Early stage exploration and prospecting work at the Knapdale Property has identified auriferous quartz veins and quartz stringer zones that are generally emplaced along tensional fracture/fault zones within the quartzite and quartz-mica schist wall rocks and at the contact between the Upper Erins Quartzite and the Stronchullin Phyllite. The veining tends to horsetail at significant flexure points that correlate with, for example, undulations/folds within the contact zone of the units. There is also evidence for possible en-echelon vein development. The higher-grade Au-Ag mineralisation (>10 g/t Au) is invariably associated with quartz veins that contain approximately 2-3% sulphide and



locally up to more than 10% sulphide. The most common sulphides are pyrite, galena, chalcopyrite, and locally, sphalerite.

Copper dominant, stratiform, disseminated pyrite mineralisation is documented in the eastern portion of the Knapdale Property within intensely hematite-silica-altered sericite schist host rocks with chalcocite, chalcopyrite, malachite and rare azurite. This mineralisation is associated with stratiform and discordant copper-rich veins and local chalcopyrite enrichment within the pyrite belt, an elongated zone of weak stratiform sulphide mineralisation in Dalradian Supergroup (Argyll Group) metasedimentary rocks.

Based on the authors review of historical Government studies at Knapdale South and the 2014-2018 exploration work completed by Lorne Resources, the authors conclude that there are currently 4 known primary areas of interest at the Knapdale Property. These include:

- Au-Ag-Cu orogenic quartz vein occurrences at Stronchullin (Stronchullin subproperty), Allt Dearg (Ormsary North sub-property) and Coire Odhar (Ormsary South sub-property); and
- Stratiform Cu-Co-Ag-Zn at Gossan Burn (Ormsary North sub-property).

#### 1.16 Recommendations

The historical, and Lorne Resources 2014-2018 geological and analytical results presented in this Technical Report show that the Knapdale Au-Ag Project is a property of merit for the discovery of orogenic and stratiform massive sulphide Au-Ag-Cu deposits and requires further exploration. It is recommended that the Property be advanced through a Two-Phase exploration program:

- Phase 1 work program that includes base of till/deep overburden geochemical sampling surveys, a ground geophysical orientation and target delineation survey, and a 14-hole diamond drill program at the Stronchullin prospect.
- Phase 2 work program that includes additional deep-delineation and infill drilling at Stronchullin, and exploratory drilling at the Allt Dearg and Gossan Burn prospects.

The total cost of the recommended exploration work is estimated at CDN\$2.76 million; with a 10% contingency, the total cost estimate is CDN\$3.03 million (Table 1.1). The cost of the Phase 1 work is estimated to cost CDN\$796,000. Phase 2 work is dependent on the positive results of the Phase 1 work.



#### Table 1.1 Summary of exploration work recommendations to advance the Knapdale Property with preliminary cost estimates.

Phase	Prospect	ltem	Description	Cost \$CDN	Cost £
	Multiple Knapdale prospects	Deep till/soil sampling program	A deep soil/overburden sampling survey over the interpreted 1,800 m strike-length of the Stronchullin vein system (approximately 350 samples) and to extend the Gossan Burn soil grid (approximately 250 samples)	\$66,000	£38,372.09
Phase 1	Multiple Knapdale prospects	Geophysical ground surveys	Orientation and exploratory ground magnetic and HLEM geophysical surveys to test known occurrences and delineate new drill targets. Approximately 60 line-kilometres.	\$55,000	£31,976.74
	Stronchullin	Diamond drill program (1st phase)	Fourteen drillholes totalling approximately 1,500 m. Exploratory and infill program to follow-up on the 2017- 2018 drill program.	\$675,000	£392,441.86
	Stronchullin	Diamond drill program (2nd phase)	Fifteen drillholes totalling approximately 3,000 m. Deep stratigraphy testing and infill drilling toward a potential resource estimation.	\$1,350,000	£784,883.72
se 2	Allt Dearg	Diamond drill program	Four exploratory drillholes totalling approximately 250 m.	\$112,500	£65,406.98
Phase 2	Gossan Burn	Diamond drill program	Six to eight exploratory drillholes totalling approximately 1,000 m.	\$450,000	£261,627.91
	Multiple Knapdale prospects	Technical Reports	Technical Reports that may include a Qualified Person site inspection, 3-D geological modelling a maiden inferred resource estimation(s).	\$46,000	£26,744.19
			Sub-total (Phase 1)	\$796,000	£462,790.70
			Sub-total (Phase 2)	\$1,958,500	£1,138,662.79
			Sub-total (Phase 1 and Phase 2)	\$2,754,500	£1,601,453.49
			Contingency (10%)	\$275,450	£160,145.35
			Total estimated exploration work cost	\$3,029,950	£1,761,598.84

Conversion rate is based on the one-year average of 1.72 Canadian Dollar equals 1 Pound Sterling



## 2 Introduction

### 2.1 Issuer and Purpose

This Technical Report has been prepared for the issuer, Cassowary, by APEX Geoscience Ltd. (APEX) and Lakehead Geological Services Inc. (Lakehead). The Technical Report trigger is the Transaction in which Cassowary (a TSX Venture Exchange listed "capital pool company") acquires WGE. By way of this commerce, Cassowary takes over Lorne Resources, a wholly owned subsidiary of WGE. As a result, Cassowary becomes the beneficiary of the Lorne Resources Prospecting Agreements and associated 2014-2018 exploration work at the Knapdale Au-Ag Project in southwestern Scotland.

The Knapdale Property (or the Property) is in the parish of Knapdale South in the district and county of Argyll near the Village of Tarbert, Argyll, Scotland. The Property is approximately 70 km west of the City of Glasgow and 50 km south of Town of Oban in the uplands of the west coast of Scotland (Figure 2.1).

The Knapdale Property includes a combination of Prospecting Agreements with landowners of the Ormsary Estate and Stronchullin Estate, in which WGE has acquired surface access and mining rights to contiguous blocks of land, or sub-properties, that collectively define the Knapdale Property. The Stronchullin, Ormsary North and Ormsary South sub-properties encompass a contiguous land position of 3,253 hectares (ha).

The Knapdale Au-Ag Project is considered prospective for the discovery of highgrade, orogenic style gold mineralisation and volcanogenic stratiform massive sulphide deposits. The Au-Ag (and Cu) mineralisation is hosted within the Neoproterozoic Dalradian Supergroup metasedimentary rocks and associated with Caledonide orogenesis tectonostructural events.

As Cassowary's proposed qualifying, flagship property, the intent of this Technical Report is to provide a geological introduction to the Knapdale Property and sufficient evidence of no less than CDN\$100,000 of exploration expenditures on the qualifying property in the last 3 years. The Technical Report was prepared in accordance with the Canadian Securities Administration's (CSA's) National Instrument 43-101 (NI 43-101). The effective date of this report is 12 June 2020.

## 2.2 Authors and Site Inspection

The authors of this Technical Report are Mr. Roy Eccles M.Sc. P. Geol. of APEX and Mr. Douglas Turnbull B.Sc. (Hons) P. Geo. of Lakehead Geological Services Inc. The authors are independent of Cassowary and WGE and are Qualified Persons (QPs) as defined by the CSA's NI 43-101. Mr. Eccles takes overall responsibility for the preparation and publication of the Technical Report.









Mr. Eccles has worked continuously as a geologist for more than 30 years since his graduation from University and has been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta ("APEGA"; Membership Number 74150) since 2003, and Newfoundland and Labrador Professional Engineers and Geoscientists ("PEGNL"; Membership Number 08287) since 2015. He has been involved in all aspects of mineral exploration, mineral research and mineral resource estimations for metallic, industrial and specialty mineral projects and deposits in North America and Europe. Work experience includes orogenic gold and multiple commodity projects within Laurentian Caledonian orogenic tectonic events associated with the development and closure of the lapetus Ocean.

Mr. Turnbull is a consulting geologist with over 30 years experience in diamond, precious and base metal exploration beyond his University degree. He holds an Honours Bachelor of Science degree in Geology and is a Professional Geoscientist recognized by the Engineers and Geoscientists of British Columbia (License #19959). He has been the President of Lakehead Geological Services Inc. since 1990. Lakehead, a geological consulting company based in Vancouver, Canada, provides a variety of exploration services to exploration and mining companies.

Mr. Turnbull completed a QP site inspection at the Knapdale Property from February 5-7<sup>th</sup>, 2020. The site visit included: a geological review of the Upper Erins Quartzite and the Stronchullin Phyllite formations; a field inspection of the Stronchullin gold prospect and the northern end of the Allt Dearg target area; and a review of 2017-2018 drill core from drillholes SD17-1,2,3,4 and 6 (Stronchullin) and OD17-1 (Allt Dearg). A total of 8 bedrock and float grab samples were collected for geochemical analysis at an independent laboratory to confirm the mineralisation potential at the Knapdale Au-Ag Project.

## 2.3 Sources of Information

This Report is a compilation of publicly available information, and proprietary information obtained during Lorne Resources 2014-2018 prospecting, deep till/soil, stream sediment and drill test programs. References in this Technical Report are made to publicly available reports that were written prior to implementation of NI 43-101, including government geological publications that are available through the British Geological Survey. These reports are cited in Section 27, References.

Government reports and Thesis include those that depict the bedrock stratigraphy, Caledonide tectonic evolution and mineral deposit studies (e.g., Peach et al., 1907, 1911; Wilson, 1921; Smith et al., 1978; Mohammed, 1987; Gunn, 1989; British Geological Survey, 1993; Taylor et al., 1995; Gunn et al., 1996; Colman et al., 2000; MacDonald et al., 2003). Journal articles were used to corroborate the geological environment, orogenic gold potential, potential deposit models and to reference historical mineral exploration work in the general Knapdale Property area (e.g., McCallien, 1926; Roberts, 1974; Harris et al., 1978; Yui, 1983; Slack, 1993; Groves et al., 1998; Dempster et al., 2002; Smith and Rasmussen, 2008; Chew et al., 2010; Dewey et al., 2014; Rice et al., 2016).



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

Geochemical and geotechnical data presented in this Technical Report were analyzed at OMAC Laboratories Limited in Galway, Ireland (ALS Loughrea; accredited to 17025:2005), Derwentside Environmental Testing Services of Durham, UK (accredited to ISO/IEC 17025:2017), and Portable Spectral Services Pty Ltd. of West Perth, WA. These labs are independent, accredited third-party chemical or spectral testing laboratories. The senior author has reviewed the geochemical data results and found no significant issues or inconsistencies that would cause one to question the validity of the data.

## 2.4 Units of Measure

With respect to units of measure, unless otherwise stated, this Technical Report uses:

- Abbreviated shorthand consistent with the International System of Units (International Bureau of Weights and Measures, 2006).
- 'Bulk' weight is presented in metric tonnes ("tonnes"; 1,000 kg or 2,204.6 lbs.).
- OSGB36 coordinates are Easting and Northing on the Airy 1830 ellipsoid.
- Currency in Canadian dollars (CDN\$) and/or British pound sterling, or GBP (£).

## 3 Reliance of Other Experts

The authors are not qualified to provide an opinion or comment on issues related to legal agreements, royalties, permitting and environmental matters. Accordingly, the authors disclaim portions of this Technical Report in Section 4, Property Description and Location. The QPs relied on background information and communication with respect to mineral tenure (Sections 4.1 and 4.2), royalties (Section 4.3) and granted Crown Option Leases (Section 4.4.3).

The information was provided to APEX by WGE's management team (Mr. Ross McLellan and Mr. Patrick Waters) during the May 2020 preparation of the Technical Report. Property-specific documentation included copies of the landowner-Company surface access right agreements, landowner-Company mining right agreements and a Copy Deed of the Crown Charter 1907. Additional clarification and confirmation of the documents was provided by WGE's legal counsel on 29 May 2020 and 1 June 2020. The documents and legal comments helped the authors clarify and validate the agreement documents and the content presented in Sections 4.1 to 4.3 and 4.4.3.



## 4 **Property Description and Location**

## 4.1 **Property Description and Location**

The Knapdale Property is in the parish of Knapdale, and more specifically in the parish of Knapdale South in the district and county of Argyll near the Village of Tarbert, Argyll, Scotland. The Property is approximately 70 km west of the City of Glasgow and 50 km south of the Town of Oban in the uplands of the west coast of Scotland (Figure 2.1).

To convey the spatial extent and mineral and surface rights of the Knapdale Property, the reader should be aware of the following simplified mineral tenure legislation in Britain:

- 1. The rights to non-fuel minerals in Britain, apart from gold and silver, are mainly in private ownership (i.e., landowners).
- 2. The mineral rights to gold and silver in most of Britain are mostly owned by the Crown.
- 3. It is possible to have gold and silver mineral rights transferred to the landowner by Crown Charters that consolidate ownership of minerals and land.

The Knapdale Property includes a combination of agreements with landowners of the Ormsary Estate and Stronchullin Estate in Knapdale South (Figure 4.1). Within these landowner areas, WGE (through Lorne Resources) acquired surface access rights and mineral mining rights to 3 contiguous blocks of land, or sub-properties, that collectively define the Knapdale Property. The collective Property encompasses a total area of 3,253 ha and is centred at approximately 181,650 m Easting and 675,400 m Northing (OSBG36), or Latitude 55°96.97' North, Longitude 5°46.36' West. A description of the Knapdale sub-properties and their respective mineral rights are summarized below and presented spatially in Figure 4.2:

- 1. Stronchullin sub-property: Surface access rights and gold and base metal mining rights Prospecting Agreements with Stronchullin Estate over an area of 865 ha. The sub-property is centred at approximately 183,900 m Easting and 679,100 m Northing (OSBG36).
- Ormsary North sub-property: Surface access rights and gold and base metal mining rights Prospecting Agreements with Ormsary Estate over an area of 709 ha. The sub-property is centred at approximately 182,800 m Easting and 677,200 m Northing (OSBG36).
- 3. Ormsary South sub-property: Surface access rights and base metal mining rights Prospecting Agreements with Ormsary Estate over an area of 1,679 ha. The subproperty is centred at approximately 181,650 m Easting and 675,400 m Northing (OSBG36).















### 4.2 Mineral Tenure and Issuer's Title

The mineral tenure is defined by Prospecting Agreements with individual landowners. The Prospecting Agreements at the Knapdale Property are held by Lorne Resources, a wholly owned subsidiary of WGE, with owners of each of Stronchullin and Ormsary estates, with option to lease (if exercised, giving right to mine and surface access). No surface working is permitted at Stronchullin (with exception of any future vent or emergency access shafts required for safe underground mine development).

The Ormsary South sub-property includes surface access rights and base metal mining rights agreements. Mining rights to gold and silver at Ormsary South are owned by the Crown.

The Stronchullin and Ormsary North sub-properties includes surface access rights, and base metal and gold and silver mining rights agreements. Gold and silver are included in these agreements because these sub-properties are subject to the Crown Charter 1907 thus consolidating ownership of minerals and land.

The landowners have granted exclusive mineral exploration surface access to Lorne Resources for up to 15 years from 2018. Work commitments of £1.5 million before 29 July 2022 and £3 million in total before 29 July 2024. Prospecting Agreements may be terminated by landowners if the work commitment is not met. The option period under the Prospecting Agreements expires on 28 January 2033.

In connection with the proposed Transaction, Cassowary, WGE and the holders of a majority of the outstanding shares of WGE entered into a binding definitive share exchange agreement dated effective July 14, 2020 providing for the completion of a business's combination, wherein Cassowary will acquire all of the issued and outstanding shares of WGE (and indirectly acquire WGE's wholly-owned subsidiary Lorne Resources). The Transaction is intended to constitute the "Qualifying Transaction" of Cassowary (as defined in Policy 2.4 of the TSX Venture Exchange) and will result in a reverse takeover of Cassowary.

## 4.3 Royalties

Annual option fee schedules to each of Ormsary and Stronchullin owners is currently £5,000 index linked since 2018, rising to £10,000 index linked in 2023 and £15000 index linked in 2028. If leases are acquired, each landowner is paid:

- 1. Certain rent of £40,000 per annum, index linked; and
- 2. Merging with certain rent, a royalty of:
  - a. 2% net realisable value on all base metals and
  - b. 1.5% net realisable value of gold and silver, plus a share of any saving in royalty payable to the Crown for gold and silver as presented in Table 4.1.



Royalty is payable to the Crown on all gold and silver extracted. This is likely to be 4% of net realisable value, but the amount is not certain due to the archaic nature of the regulating legislation (Mines and Metals Act 1592) and Crown Charter (1907).

There are no back-in rights.

 Table 4.1 Royalty payable to the Crown for gold and silver.

Crown Royalty	Additional Royalty payable
3.0% or above	0
2.90%	0.05%
2.60%	0.20%
2.45%	0.28%
2% or less	0.50%

## 4.4 Permitting, Environmental Liabilities and Significant Factors

## 4.4.1 Permitting

Mineral planning and decisions on planning applications are a responsibility of a local authority body designated as the Mineral Planning Authority under the legislation established under the Town and Country Planning Act 1990 (Section 97, Part II of Schedule 5, and Schedule 9). Minerals extraction may only take place if the operator has the agreement of the landowner and has obtained both a planning permission from the Mineral Planning Authority and any other permits and approvals.

Mineral working permission will be required from the local planning authority, under a process regulated by legislation. Associated permits and approvals may include:

- Permits relating to surface water, ground water and mining waste, issued by the Scottish Environment Protection Agency (under Scottish legislation related to the EU Water Framework Directive and Mining Waste Directive).
- Additional consents, such as relating to diverting and reinstating rights of way or temporary road orders, may need to be obtained. Additional rights of way and land use may need to be secured from landowners or existing tenants.

To date, WGE has not applied for any permits.

## 4.4.2 Environmental Liabilities

No residual environmental liabilities are known or expected within the Knapdale Property. At present, there are no national, sensitive or scenic areas within the Knapdale



Project area. The closest environmentally sensitive area to the project is the Knapdale National Scenic Area, which was established in 1981, is one of 40 national scenic areas in Scotland and has a spatial extent of 32,832 ha (divided into 20,821 ha and 12,011 ha of land- and marine-based areas). The Knapdale National Scenic Area is located to the west of the Knapdale Property (Figure 4.2).

## 4.4.3 Other Property-Related Significant Factors

Under the Scottish Crown Estate Act 2019, the Crown Estate Scotland practice in relation to the grant of rights to exploit the Mines Royal has been to grant options to lease. rather than ownership rights. The lease option provides several years to prove the existence of a workable reserve. Lease grants in the Knapdale area are documented in Section 23, Adjacent Properties. Part of the Knapdale Project falls within a granted and current Lease Option belonging to Scotgold Resources Ltd. (Scotgold; Crown Estate Scotland, 2020). The Crown grant to Scotgold, however, does not affect Au-Ag exploration in the Stronchullin and Ormsary North sub-properties because any such exploration will be subject to the Crown Charter 1907, and no participation is required from Scotgold whether during exploration or lease phase, nor can Scotgold prevent exploration or leasing by Lorne Resources (pers. comm., Cassowary Capital Corporation Ltd., 2020). Furthermore, the Crown's grant to Scotgold does not entitle surface access for exploration without landowner consent, and Scotgold cannot obtain a Crown lease of the gold unless the surface owner grants access. The landowner has granted exclusive surface access to WGE, for up to 15 years from 2018 (i.e., to 28 January 2033). The Crown grant to Scotgold expires in November 2024.

Lastly, two wind farms are present within the Stronchullin and Ormsary North subproperties. An agreement with wind farm operators may be required to regulate the wind farm operators' current rights to not have their operations materially or adversely affected.

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

## 5.1 Accessibility

The name, Knapdale, is derived from two Gaelic elements: 'Cnap' meaning hill and 'Dall' meaning field and forms the rural district of Argyll and Bute in the Scottish Highlands. The district is bordered by the Kintyre Peninsula to the south, the Crinan Canal to the north and by sea to the east and west (Loch Fyne and Sound of Jura, respectively). The sea loch of West Loch Tarbert cuts off the area from Kintyre.

The population of Knapdale is 2,836 according to the United Kingdom Census 2001. Most of the people live in Knapdale South (2,435). Places in Knapdale include predominantly small coastal villages of: Achahoish; Achnamara; Ardrishaig; Crinan; Kilberry; Kilmory; and Tayvallich (Figure 5.1). Many of these villages are on the west coast of Knapdale in the Scottish council area of Argyll and Bute.









Much of Knapdale is in the ownership of Forestry and Land Scotland as the Knapdale Forest, planted in the 1930s, covers much of the region. The two largest private estates are located to either side of Loch Caolisport: the Ellary & Lochead Estate which covers 11,183 acres (4,526 ha) acres on the north side of the loch, and the Ormsary Estate, which covers 19,595 acres (7,930 ha) acres on the southern side. The Ormsary Estate belongs to the family of Sir William Lithgow, 2<sup>nd</sup> Baronet of Ormsary and Vice-Chairman of Scottish shipbuilding company Lithgows.

The Argyll and Bute council area is one of 32 unitary authority council areas in Scotland and represents the second-largest administrative area of any Scottish council. The administrative centre for the council area is in Lochgilphead, a town and former burgh with a population of around 2,300 people at the end of Loch Gilp (a branch of Loch Fyne) and on the banks of the Crinan Canal. The Knapdale region can be accessed by vehicle from Lochgilphead by taking the B841 toward Crinan, turn left at Bellanoch onto the B8025 toward Tayvallich and into the heart of Knapdale.

The A83 is a major road in the south of Argyll and Bute and runs up the eastern coastline of the area between Tarbert and Lochgilphead; the B8024 also links these two places but does so via a much longer route along the north shore of West Loch Tarbert and the western coast of South Knapdale (Figure 5.1). Most of the western coastline of North Knapdale is accessible by two unclassified roads, although there is a gap between Kilmory and Ellary where the route is not public road. The B8024 through Knapdale forms part of Route 78 of the National Cycle Network. Gravel roads run throughout the Property.

The entrance to the Stronchullin Farm is not gated; however, gated access is to the wind farm and hydro installations classified as an Industrial Site under Health and Safety and visitors are required to sign a login book inside the property entrance. The Allt Dearg Wind Turbine Farm, approximately 3 km southwest of Stronchullin, is accessed from the north by a gravel road that runs initially east west along the north side of Stronchullin Burn before turning to the south towards Allt Dearg.

The nearest urban city center is Glasgow (approximately 612,000 persons). The wider Glasgow metropolitan area is home to over 1.8 million people equating to approximately 33% of Scotland's population. Glasgow grew from a small rural settlement on the River Clyde to become the largest seaport in Scotland, and tenth largest by tonnage in Britain. Glasgow has the largest economy in Scotland and has the third highest GDP Per capita of any city in the UK (after London and Edinburgh).

Glasgow is located approximately 64 km due east of the Knapdale. Travel distance by vehicle from Glasgow to the Property takes a longer, northern, land route of approximately 155 km, via the M8 and A82 to A83 in Argyll and Bute Council. International travellers can access the Knapdale Property by flying into the Glasgow International Airport (GLA) and travelling by vehicle to the Property. In 2019, the Glasgow International Airport handled 8.8 million passengers making it the second-busiest airport in Scotland after the Edinburgh Airport and ninth-busiest airport in the United Kingdom. There are also several



smaller, domestic and private airports around the city. There is a heliport, Glasgow City Heliport, located at Stobcross Quay on the banks of the Clyde.

## 5.2 Site Topography, Elevation and Vegetation

The western coast of Knapdale is deeply indented by two sea lochs, Loch Sween and Loch Caolisport. The highest point within the Knapdale Property is Stob Odhar, at 562 m above sea level (Figure 5.1). Alongside Stob Odhar two other summits within Knapdale are categorised as Marilyns: Cruach Lusach (467 m) and Cnoc Reamhar (265 m), however there are no summits above 600 m in the area.

The Forestry Commission manages three forests within Knapdale: Dunardry Forest; Crinan Forest; and Knapdale Forest. From 2008 to present, Knapdale is home to the Scottish Beaver Trial, a unique partnership project that led to the successful reintroduction of beavers to the UK. The Eurasian beaver was introduced to Knapdale and by 2016 the Scottish Government announced that beavers could remain permanently and were granted protected status as a native species within Scotland. Other wildlife in Knapdale includes red deer, otter, red squirrel, common seal, and golden eagle.

## 5.3 Climate

As an administrative center, Lochgilphead has climate data recorded at approximately 9 m above sea level that is classified as an oceanic climate (Köppen: Cfb). As with most of the West Highlands, there are low sunshine levels and high amounts of rainfall, with around 1,150 sunshine hours and nearly 2,000 mm of rainfall annually (Table 5.1).

Glasgow's climate is also classified as oceanic (Köppen Cfb). Winters are cool and overcast, with a January mean of  $5.0^{\circ}$  C with extreme instances of about  $-12^{\circ}$  C. Snowfall accumulation is infrequent and short-lived. The spring months (March to May) are usually mild and pleasant. During the summer months (June to August) the weather can vary considerably from day to day, ranging from relatively cool and wet to quite warm with the odd sunny day. Generally, the weather pattern is unsettled and erratic during these months, with only occasional heatwaves. The warmest month is usually July, with average highs above 20° C. Summer days can occasionally reach up to 27° C, and rarely exceed 30° C. Autumns are generally cool to mild with increasing precipitation. During autumn there can be some settled periods of weather with mild temperatures and some sunny days. With an oceanic climate and minimal number of below freezing temperatures, exploration could continue year-round.

## 5.4 Local Resources and Infrastructure

People in Knapdale are mostly forestry workers, upland sheep farmers and fishermen; however, Scotland has over a century of mining experience. Coal mining was once the major powerhouse of the British economy with more than one million workers in the 1910s and 1920s. At this time, the area around Lanarkshire, Scotland produced around half of Scotland's coal, with over 200 mines employing over 40% of the Scottish coal workforce – about 65,000 men and women.



Month	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high (°C)	7	7.6	9	11.8	15.1	17.1	18.6	17.5	15.8	12.5	9.3	7.4	12.4
Average low (°C)	1.8	2	3.1	4.1	6.6	9.4	11.2	10.7	9.5	6.8	4	1.9	5.9
Average rainfall (mm)	240	151.1	192.6	113.6	82.5	100.9	100.9	137.3	168.9	239.3	204.6	193.4	1,925.10
Average rainy days (≥ 1 mm)	21.2	14.8	18.5	13.7	12.7	15.2	15.9	15.6	18.8	19.2	18.7	18.4	202.7
Mean monthly sunshine hours	37.4	59.6	82.5	141.3	180	157.9	138.3	119	86.4	71.6	47.2	28.3	1,149.50

Since that time, shifting attitudes toward coal and the emergence of alternative energy sources such as wind and solar have seen coal's role in the energy mix diminish. By 1990, the coal industry still employed some 50,000 people, however from 2016 onward, this figure had been reduced to approximately one thousand workers.

The liquid petroleum and natural gas industry in Aberdeen began with the discovery of significant oil deposits in the North Sea during the mid-20<sup>th</sup> century. Aberdeen became the centre of Europe's petroleum industry. Despite declining North Sea petroleum reserves, Aberdeen remains a major world center for undersea petroleum technology. The North Sea offshore oil and gas play provides employment for approximately 135,000 workers (Rigzone, 2020).

A super quarry of consistently high quality, durable granite is located at Glensanda, near the Town of Oban on the West Coast of Scotland. The quarry has an annual production capacity in excess of 9 million tonnes and has shipped granite for over 30-years to markets all across Northern Europe. The mine is one of the largest single quarry operations in the world, employing 120 direct workers and supporting a further 300 third-party jobs.

The Foss Baryte Mine in Perthshire was discovered in 1976, developed in the early 1980s and has produced baryte (barium sulphate BaSO<sub>4</sub>) for 40-years. Baryte production is currently being transferred to the nearby and in-development Duntanlich Mine. The mines provide skilled employment for around 30 people with indirect employment opportunities for local suppliers and contractors in transportation, site maintenance and other support requirements.

Other forms of mining include limestone and dolomite (14 operating quarries in Scotland), oil-shale, fireclay, ironstone and metalliferous mining, including precious-, base- and specialty metals (MacDonald et al., 2003).



Once a dominant export-orientated manufacturing hub (e.g., shipbuilding and other heavy engineering) Glasgow's economy has gradually become more diversified. Glasgow's economy has seen significant relative growth of tertiary sector industries such as financial and business services, communications, biosciences, creative industries, healthcare, higher education, retail and tourism.

## 6 History

#### 6.1 Introduction to Britain's Mineral Resources (Outside of the Knapdale Property)

The QP has been unable to verify the specific mineral deposit and resource information presented in this sub-section, and therefore, the reader should be aware the information is for background purposes only and is not necessarily indicative to the mineralisation on the Knapdale Property that is the subject of the Technical Report.

At the continental-scale, several authors have clearly demonstrated that the basement rocks of northwestern Scotland and western Ireland were formerly adjacent to the margin of the North American continent (e.g., Murchison, 1859; Peach et al., 1907; Leslie et al., 2008; Storey, 2008). As a simple explanation of the current juxtaposition of these land blocks, the Appalachian – Caledonian Orogen represents a major Palaeozoic crustal feature associated with the development and closure of those parts of the lapetus Ocean that were situated between Laurentia and Avalonia, Baltica and Gondwanaland (see Section 7 for additional geological detail). Events created by the destruction of a Palaeozoic Ocean during the orogeny resulted in the reworking of its existing sedimentary rocks with a period(s) of intense metalliferous mineralisation.

Evidence of mineralising event(s) along this suture zone is now reflected in mineral deposits located within the Caledonide tectonostratigraphic zones that include the Exploits subzone in Newfoundland, Canada and the Dalradian Supergroup of Scotland and Northern Ireland which overlie the Laurentian basement (Figure 6.1).

Focusing on Britain mineral deposits, traditional metallic mineral mining has occurred in Britain for over 2,000 years. A summary of active metallic mineral British projects is presented in Figure 6.2 with selected deposits presented in Table 6.1. With respect to British gold-silver deposits, which are the focus of this Technical Report, a variety of mineral deposit types are present and include, for example: sedimentary exhalative deposits (SEDEX); mesothermal lode gold deposits; volcanogenic massive sulphide deposits; epithermal deposits and porphyry-style deposits. Mesothermal gold deposits occur northwest of the Highland Boundary fault within Grampian terrain underlain by Laurentian basement as illustrated in the previous text and Figure 6.2.

Selected metallic mineral projects, including advanced orogenic gold deposits in orogenic structurally controlled, mesothermal gold-bearing quartz and quartz-sulphide vein systems in Dalradian metasedimentary rocks, are described in additional detail in the text that follows.





Figure 6.1 Spatial relationship between known mineral deposits, the lapetus Suture Zone and its continental shoulders that formed during the Caledonide-Appalachian Orogen. The Knapdale Property is situated within the Laurentian basement.



Name	Company	Commodities	Location	Status
Omagh mine (formerly Cavanacaw)	Galantas Gold Corporation	Au, Ag, Pb	Omagh, N Ireland	Operating mine
Foss Mine Duntanlich mines	Mi Swaco (Schlumberger)	Barite	Alberfeldy, Scotland	Former mine In development
Curraghinalt	C3 Resources Inc	Au, Ag	Omagh, N Ireland	Active exploration
Cononish	Scotgold Resources Ltd	Au, Ag	Tyndrum, Scotland	Active development
Parys Mountain	Anglesey Mining plc	Zn, Cu ,Pb, Ag, Au	Anglesey, N Wales	Care and maintenance
Arthrath	Alba Mineral Resources plc	Cu, Ni, PGE	Ellon, Aberdeenshire	Active exploration
South Crofty	Western United Mines Ltd	Sn	Cornwall	Active development
Hemerdon	Wolf Minerals Ltd	W, Sn	Devon	Former mine

#### Table 6.1Summary of active development projects in Britain.

To reiterate, the QP has been unable to verify the specific mineral deposit and resource information presented in the following text, and therefore, the information is not necessarily indicative to the mineralisation on the Knapdale Property that is the subject of the Technical Report.

#### 6.1.1 Cononish, west-central Scotland

Discovered in 1984, Scotgold's Cononish Gold Project is in the Grampian Highlands of mid-western Scotland. The deposit occurs within Dalradian metasedimentary rocks with mineralization related to magmatic sources in which the sulphides are associated with plutonic intrusions, and specifically, sulphide from the Etive granite (Lowry et al., 2005; Rice et al., 2012; Hill et al., 2013).

JORC resource and reserve estimations were published by Scotgold in 2015 and are presented in Table 6.2. Scotgold estimates that the deposit could potentially produce 20,000 to 30,000 ounces of gold a year (Scotgold Resources Ltd., 2020).

## 6.1.2 Curraghinalt, Northern Ireland

Discovered in 1983, high-grade gold mineralisation occurs as a series of westnorthwest trending, moderately to steeply dipping, subparallel stacked veins and arrays of narrow extension veinlets in Dalradian metasedimentary rocks. The vein swarm has been modelled along strike for approximately 2,300 m, across strike for approximately 800 m and down dip for over 1,200 m by prospecting, trenching, and drilling (Leuangthong et al., 2018). Intensive drilling, together with about 700 m of underground development, has been concentrated in a central 400 m section of this trend. The NI 43-101 mineral resource estimate prepared for Dalradian Resources Inc. is presented in Table 6.3.









# Table 6.2 Resource and reserve estimates at the Cononish Mine using a cutoff grade of 3.5 g/t Au (Scotgold Resources Ltd., 2015a,b).

A) Resources					
		Grade	Metal	Grade	Metal
		Au	Au	Ag	Ag
	K tonnes	g/t	Koz	g/t	Koz
Measured – In-situ	60	15	29	71.5	139
Indicated – In-situ	474	14.3	217	58.7	895
Indicated – Mined Stockpile	7	7.9	2	39	9
Sub-total M & I	541	14.3	248	59.9	1,043
Inferred – In-situ	75	7.4	18	21.9	53
Total MRE	617	13.4	266	55.3	1,096
B) Reserves					
,		Grade	Metal	Grade	Metal
		Au	Au	Ag	Ag
	K tonnes	g/t	Koz	g/t	Koz
Proven	65	11.5	24	51.5	108
Probable	490	11.1	174	47.2	743
Total	555	11.1	198	47.7	851

#### A) Resources

A mineral reserve was prepared in 2016 (JDS Energy & Mining Inc., 2017); however, Leuangthong et al. (2018) state the reserve is no longer current.

# Table 6.3 Resource estimate at the Curraghinalt Gold Mine using a cutoff of 5 g/t Au (Leuangthong et al., 2018).

	Million Tonnes	Grade (g/t Au)	Contained gold (ounces)
Measured	0.04	26.04	33,000
Indicated	6.31	14.95	3,033,000
Measured + Indicated	6.35	15.02	3,066,000
Inferred	7.72	12.24	3,038,000

#### 6.1.3 Omagh Mine (formerly Cavanacaw), Northern Ireland

Discovered in 1987, Galantas Gold Corp.'s currently operating Omagh Mine comprises quartz veins up to a metre wide with disseminated to massive auriferous sulphides, (predominantly pyrite and galena with accessory arsenopyrite and chalcopyrite). The most recent PERC and NI 43-101 resource estimate was published in 2014 (Phelps et al., 2020; Table 6.4). The processing facility is now fully operational, producing 701 tonnes of wet concentrate in the second quarter of 2009 containing 1977 ounces of gold. Gold, silver and lead are recovered from these sulphide concentrates and are processed in Canada.


		Grade	Gold
	Tonnes	(Au g/t)	(ounces)
Measured	138,241	7.24	32,202
Indicated	679,992	6.78	147,784
Inferred	1,373,879	7.71	341,123

# Table 6.4 Historical resource estimate at the Omagh Mine using a cutoff of 2 g/t Au (Phelps et al, 2014, 2020).

## 6.1.4 Foss and Duntanlich Baryte Mines, West-Central Scotland

The Foss baryte mine was discovered in 1976 and opened in the early 1980s by MI Swaco, The Foss Mine has produced baryte (barium sulphate BaSO<sub>4</sub>) for over 40-years. Annual production from the Foss Mine was about 50,000 tonnes, and the ore is finely ground for use in oil exploration drilling. In addition to fluorspar a lead (galena) floatation concentrate is produced as a local by-product. The Foss Mine was abandoned in 2018 and the proximally located Duntanlich Mine is in the developmental stages by the same operator.

The stratabound baryte deposits are hosted in Dalradian Supergroup rocks (Ben Eagach Schist Formation). The deposits and occurrences are documented over an area of approximately 200 km across central Scotland from Islay in the southwest to Portsoy in the northeast (British Geological Survey, 2006).

# 6.1.5 Other Notable Gold Workings in Proximity to the Knapdale Property

The QP has been unable to verify the specific mineral deposit and resource information presented, and therefore, the information is not necessarily indicative to the mineralisation on the Knapdale Property that is the subject of the Technical Report.

Several base-metal vein deposits/occurrences have been discovered in the Knapdale area (and not within the project area); primarily copper and lead with minor silver (Peach et al., 1911). The vein showings are dominantly oriented north-east with minor north-west and east-west trends. Some of the quartz veins were historically mined via underground adits and shafts. The largest of these was located on the Inverneil Estate, south of the Inverneil Burn on the northern flanks of Cruach Mheadonach where mineralisation occurs as pyrite and galena within breccias and quartz reefs, hosted within a series of quartz schists and phyllites with minor thin limestone, assigned to the Lower Erins Quartzite.

Here, the quartz vein exploited is up to 30 cm wide and trends Azimuth 330°, dipping to the southwest. Wilson and Flett (1921) report 0.79 ppm Au in the lead ore from one of these workings. Veins associated with this site are documented as "early quartz veins" that are like those of mesothermal veins in younger Phanerozoic metamorphic belts but are rare in the Scottish Dalradian (Anderson et al., 2004). Hence, their paragenesis is



different in comparison to the vein systems at the Knapdale Property (i.e., Stronchullin prospect).

## 6.1.6 Other Notable Copper Workings in Proximity to the Knapdale Property

The QP has been unable to verify the specific mineral deposit and resource information presented, and therefore, the information is not necessarily indicative to the mineralisation on the Knapdale Property that is the subject of the Technical Report.

1970s investigations by Noranda-Kerr Ltd. and the BGS documented polymetallic sulphide mineralisation of probable volcanogenic origin in the south Knapdale Meall Mór around the catchment of Abhainn Srathain; Smith et al., 1978). A significant amount of geological survey work was completed. Due to the proximity of the Abhainn Srathain to the Knapdale Property area, the details of this dominantly copper-focused exploration work are documented in the text that comprises the remainder of this sub-section.

Abhainn Srathain is about 1 to 2 km south of Meall Mór and represents one of the larger areas of historical mineral workings. This area was exploited at the end of the 18<sup>th</sup> century and consists of stratiform and discordant Cu veins (Smith et al., 1978; Gunn et al., 1996). One objective of the BGS work was to assess the economic potential of the southwesterly extension of the Perthshire pyrite belt, an elongated zone of weak stratiform sulphide mineralisation in Argyll Group metasedimentary rocks traceable for approximately 190 km from Glenshee in the north-east, to Knapdale in the south-west. The Perthshire pyrite horizon developed within the Easdale Subgroup whereas, at Knapdale, the pyrite belt occurs within stratigraphically overlying Crinan Subgroup.

The investigation of Smith et al. (1978) at the Meall Mór – Abhainn Srathain project area involved ground geophysical surveys (chargeability, resistivity and magnetics) and detailed drainage surveys, deep till/soil sampling. The targeted geophysical and geochemical traverses were spaced at 150 m intervals and 500 – 800 m in length (Smith et al., 1978).

A total of thirty east-west geophysical lines covered and area extending from 00 at the Abhainn Srathain historical mines north-northeast to line 5100N near the coast and south-southwest to line 1350S (Figure 6.3 and Figure 6.4; Smith et al., 1978). North of 1500N the line spacing was 300 m, while all other lines south over Meall Mór itself and in the region of the mines line spacing was 150 m. Huntec Mark III IP equipment was used to measure chargeability and apparent resistivity for both surface and downhole surveys.

A dipole-dipole array was used with a length of 30 m and center to center dipole separation 90 m (n = 3) that can detect anomalies up to 45 m depth. Chargeability was defined as the time integral of the decay voltage (normalized with respect to the transmitter voltage) measured between 75 and 525 ms after termination of a two second square wave transmitted pulse. The chargeability  $M_{75}^{525}$  thus calculated was found experimentally to be 0.75 of the value  $M_{240}^{1140}$  which has generally been used for surveys conducted under the DI program.



Figure 6.3: Chargeability profile for geophysical lines (Smith et al., 1978). Resistivity and magnetics not shown but available by Smith et al. (1978). Three of the five drillholes are plotted with BH2 drilled under the Abhainn Srathain mine.





Total magnetic field was measured at 15 m intervals along the lines using a Geometrics proton Magnetometer. Slingram EM was tried near the old mines but no anomalies were found. An IP anomaly was found stretching from south of Meall Mór to the old mine workings on Abhainn Srathain, likely due to a local enrichment of pyrite and chalcopyrite within the pyrite zone (Smith et al., 1978).

Deep till/soil samples were collected at 50 m intervals on east-west traverse lines spaces 150 m apart with a 2.54 cm (1-inch) diameter hand auger which can sample down to 1.30 m (Smith et al., 1978). Overall, the deep till/soil survey yielded a wide variation in trace element data which the authors attributed to the collection of different soil horizons. The highest Cu anomaly occurs between lines 1050N and 450S (Figure 6.4; Smith et al., 1978). The highest deep till/soil anomaly yields 1870 ppm Cu, 30 ppm Pb and 1.35% Zn on line 2250N, which also has high Cu in panned concentrates (Smith et al., 1978). Following the stream to the west a rock sample with 26% Cu was discovered. This high deep till/soil anomaly is likely due to a similar small vein occurrence, which was tested by shallow drill surveys (discussed in the text below).

The regional drainage study of Smith et al. (1978) had a sample density of just over 1 sample per square kilometer around a 10 km square area with its southwest point at the National Grid Reference NR800700. The regional stream sediment samples collected were highly anomalous in Cu on Abhainn Srathain, on Allt at Erins and a tributary of Artilligan Burn (Smith et al., 1978). Anomalous stream sediment samples were followed up on a targeted stream sediment sample and deep till/soil program described below. Zinc was highly anomalous near the bottom of Artilligan Burn, downstream of a small trail recorded by Wilson (1921). Another anomalous Zn sample found south of the Stronchullin Burn is associated with the old Stronchullin 'Gold Mine' (Smith et al., 1978).

Detailed stream sediment sampling was carried out at 100 m intervals around Abhainn Srathain around the old mine workings (Smith et al., 1978). The mainstream draining the old workings is strongly anomalous in Cu (<245 ppm). Panned concentrate sample results show a similar pattern (Figure 6.5), but peak values occur further downstream from the showings, which is unusual in that stream sediment anomalies are usually further downstream of the source because of hydromorphic dispersion (Smith et al., 1978).

Representative rock samples collected from the pyrite belt contain low Au contents with local enrichment in Cu, Zn and Ba. These rocks consist of quartzite and micaceous quartzite with 1% to 2% disseminated pyrite. Samples taken around Abhainn Srathain contain 30 – 355 ppb Au and more than 3,000 ppm Cu (Figure 6.6; Gunn et al., 1996). Rock samples were collected at all auger sites (discussed in following text), the analytical results yielded little or no correlation between copper contents of rock and deep till/soil sampling programs. Grab samples of ore at the Meall Mór mines assayed up to 7% Cu, but these grabs are not considered representative samples (Smith et al., 1978). A better association was observed between the deeper deep till/soil sampling and the hand auger drilling, which collectively confirmed the anomalous copper rich Abhainn Srathain area.





Figure 6.4: Copper in deep till/soils at the Meall Mór and Abhainn Srathain areas (Smith et al., 1978).















Historically, 6 shallow-depth, inclined (inclined depth of 30-50 m) boreholes were drilled using the IGS modified Winkie drill (Figure 6.7; Smith et al., 1978). Four holes were used to test the larger disseminated copper occurrence defined on the IP anomalies. Another drillhole was located with the intention of testing the old workings of the Abhainn Srathain mine complex (Figure 6.7). The authors have been unable to determine what the 6<sup>th</sup> drillhole was targeting, or whether it was drilled.

Mineralisation from the historical drilling occurs in Upper Erins Quartzite Formation rocks with disseminated chalcopyrite and in small veins with the maximum intersection reported at 1.06% Cu over 2.67 m. Chalcopyrite is the dominant copper-bearing mineral with minor amounts of bornite and covellite and secondary malachite. Initially no gold was noted by the BGS but Mohammed (1987) observed a trace of gold in "a veinlet in a porphyroblastic pyrite". Correlation between Cu and the IP anomalies suggest a close association of chalcopyrite and pyrite.

In summary of the Meall Mór-Abhainn Srathain area, the BGS regional geochemical drainage survey showed elevated Cu-Sb at the Abhainn Srathain deposit area with significant values extended across the Knapdale Property from Meall Mór in the south to Stronchullin Burn in the north. Anomalies associated with deep till/soil surveys were attributed to two different styles of mineralisation. Disseminated enrichment of copper within the pyrite zone, which correlates with the chargeability anomaly and the narrow copper-rich veins associated with amphibolite (epidiorite). Smith et al., (1978) states low to medium gold mineralisation enrichment was identified in the Meall Mór area, near the Abhainn Srathain mine. However, Gunn et al. (1996) state no gold enrichment has been observed in the stratiform disseminated pyrite mineralisation. Note: gold prospecting at Meall Mór should not be ruled out as current work completed by Lorne Resources documented that sample RC843186 of epidote-chlorite-biotite schist with >10% chalcopyrite and 10% pyrite assayed 0.34 g/t Au + 2.59% Cu + 10 g/t Ag and 0.1% Zn.

Weak stratiform sulphide mineralisation with a strike length of 10 km in the Upper Erins Quartzite with variable copper enrichment throughout the zone was recognized by these studies. An anomalous zone described as a broad fine disseminated Cu source and to narrow Cu-rich veins were recognized around the Abhainn Srathain mine. Following this, a program of 5–6 boreholes (inclined depth of 30 - 50 m) were drilled to follow up on the mineralised zones. It was determined that any further economically oriented exploration studies should be centered on the south flank of Meall Mór, where the most promising drilling targets are defined by the broad copper in deep till/soil anomalies between lines 400N and 700N.

Close to Meall Mór, centered on the former mines at Abhainn Srathain, a discordant style of copper mineralisation is observed (Gunn et al., 1996). It consists of blebby chalcopyrite in quartz-carbonite veins and stringers, together with minor pyrite and sulphosalts. Mohammed (1987) developed a genetic model for this mineralisation involving premetamorphic hydrothermal processes in a shallow geothermal setting. However, Gunn et al. (1996) states the recrystallization and redistribution of ore and gangue minerals during regional metamorphism and deformation events must also be considered.







Abhainn Srathain: General geology and borehole sites



# 6.2 Historic Exploration and Exploitation (Within the Knapdale Property)

The Knapdale Property contains five historic occurrences, some of which have undergone small-scale historical exploitation (Peach et al., 1911; Gunn et al., 1996). Copper and lead were the principal commodities with minor production of silver recorded. Most of the exploitation focused on surface-exposed quartz veins, but more extensive underground workings include adits and shafts. These occurrences/deposits/historical adits are presented on Figure 6.8 and summarized in the following points, the number of which corresponds with those labelled on Figure 6.8.

 Stronchullin – Gold concentrations in lead-rich sulphide ore was documented at the long-since abandoned mines of Stronchullin. Production figures at Stronchullin are unknown but Gunn et al. (1996) document that historical records and observations of the small-scale excavation and soil heaps suggest the excavation material was of high grade and low tonnage. Dumps of spoil material are still present at Stronchullin. It is estimated that the dumps consist of about 2000 tonnes of mainly vein material.

The main Stronchullin quartz lode was mined by a 25 m long open cut to a depth of 6 m. Its northern extension has been investigated via several short adits on the banks of Stronchullin Burn indicating continuity over 150 - 200 m strike length. A winze was developed on the main vein north of the open cut and an east-west pit was excavated to examine the footwall and hanging wall stockwork zones.

Exposures indicate a quartz vein trending  $010^{\circ}$ , dipping  $70 - 75^{\circ}$  west and 0.5 - 1.5 m wide. The vein braids along strike incorporating horses of silicified and sericitized Upper Erins Quartzite Formation.

- Allt Dearg A small copper occurrence approximately 2.8 km southwest of Stronchullin, that includes up to 1.5 ppm Au, 520 ppm Ag and 17% Cu. The mineralization occurs in a 1 m wide quartz-carbonate-chalcopyrite-galena vein in silicified and sericitized mica schist. Historic mine workings include a 20 m excavation and an adit developed for approximately 8 m.
- 3. Srondoire A former working with unknown mineralogy. The authors have been unable to locate any additional detail on this occurrence.
- 4. An unconfirmed occurrence of trace pyrite and galena associated with elevated levels of Au and Ag occur approximately 220 m southeast of Srondoire.
- 5. Coire Mhaim A vein with abundant specks of chalcopyrite and sphalerite was observed (Gunn et al., 1996).

Some of the historical mine workings in the Knapdale Property area (Stronchullin) date back to the late 1790s when the area was accessibly only by sea (e.g., South Argyle Mining Company; Freeman, 1983; Arx, 1995).





#### Figure 6.8 Geological Map of the Knapdale Area with historic exploitation sites.



For the purposes of this Technical Report and in the subsequent historical subsection text, the authors document: 1) historical workings and surveys as documented by the British Geological Survey; and 2) more modern-day 2010's exploration work as conducted by Lorne Resources.

There are no known mineral resource estimations for these historical deposits and the authors and issuers are not regarding historical production as an illustration of the status of the occurrences/deposits in the Knapdale Property. Rather, the Knapdale Au-Ag Project is an early stage exploration project.

The Knapdale Property's 'modern' historical record of exploration commenced in 1972 when the Department of Trade and Industry ratified the *Mineral Exploration and Investment Grants Act 1972*, which refunded exploration companies with up to 35% of the exploration cost as an impetus to exploration. This *Act* encouraged Consolidated Gold Fields Ltd. to explore for copper and nickel in the Loch Fyne and Cumlodden areas, and Noranda-Kerr Limited (Noranda-Kerr) to explore for nickel, copper, lead and zinc at Knapdale.

In 1972, Noranda-Kerr conducted base metals (Cu, Pb, Zn and Ni) exploration that involved stream-sediment and soil sampling studies in the vicinity of Meall Mor. The surveys encompassed 3 estates and a traverse area of approximately 130 km<sup>2</sup>. The sampling and analytical work conducted by Noranda included:

- 89 stream-sediment samples analyzed for Cu, Ni, Pb and Zn by Noranda Exploration Ireland Ltd.
- 83 soil samples analyzed for Cu, Pb and Zn by Noranda Exploration Ireland Ltd.
- 311 soil samples analyzed for Mo by Hunting Technical Services Ltd.

The Noranda-Kerr study documented that most of the old mine workings at Knapdale were situated in areas comprised of thin quartz veins with chalcopyrite, galena, sphalerite in a gangue of quartz and calcite. The stream-sediment analytical results yielded 3 samples with >475 ppm Zn (up to 780 ppm Zn). Two soil sample analytical results had 330 ppm and 480 ppm Cu (Noranda Exploration UK Limited, 1972).

The results of the Noranda-Kerr survey encouraged the BGS to conduct follow-up geological mapping and a variety of sampling studies as part of Mineral Reconnaissance Programs.

# 6.3 Government Geological Studies (Within the Knapdale Property)

The BGS's Mineral Reconnaissance Program (MRP) was designed to provide geological, geochemical, geophysical, mineralogical and metallogenic information on prospective areas in Britain. The MRP was funded by the (then) Department of Trade and Industry between 1973 and 1997 to provide baseline geological, geochemical,



geophysical and metallogenic information on potentially prospective areas in Great Britain that would encourage private-sector investment.

This section benefits from the work of two specific MRP reports completed in the Knapdale area: Smith et al. (1978) and Gunn et al. (1996). The area of geological investigations includes the Meall Mór area, South Knapdale, Argyll (Smith et al., 1978) and over part of the central Kintyre Peninsula in the Argyll and Bute District, Strathclyde Region, western Scotland (Gunn et al., 1996). The Meall Mór area is directly east of the Knapdale property and therefore this information is reported in Section 6.1.5 (off Property historical work).

Gunn et al. (1996), however, studied the mineral potential within the Knapdale Property to assess the prospectively of known mineralised veins as sources of economic gold and base metal mineralisation. The work utilized the results of regional geochemistry stream sediment and panned concentrate surveys, rock sample lithogeochemistry surveys, mineralogical studies and conducted lineation analysis.

# 6.3.1 Mineral Reconnaissance Program: Geochemistry

Gunn et al. (1996) reported on drainage geochemical samples from 117 sites over an area of approximately 130 km<sup>2</sup>, 24 of which were collected from within the Knapdale Property. The main targets included known metalliferous veins; areas with elevated As and Sb contents defined by regional surveys; and structural lineaments identified as favorable for gold mineralisation. Sampling methodologies followed those developed for precious-metal exploration by Gunn (1989).

Most stream sediment samples returned Au concentrations of <20 ppb Au with three samples (13%) exceeding 20 ppb Au (up to 160 ppb Au, Figure 6.9; Gunn et al., 1996). The gold concentrations in samples from the Southern Highland Group rock strata were uniformly low. However, gold pathfinder elements, As, Sb and Bi had complex distributions with sporadic local enrichments (Gunn et al., 1996). Elevated concentrations of gold do occur in Argyll Group strata in two primary areas: Stronchullin area within Erins Quartzite and Stronchullin Phyllite; and a north-east-flowing tributary of the Gleann Fithich, within Erins Quartzite.

The majority of the panned concentrate samples (n=14 samples) contained contained <50 ppb Au with10 samples yielding up to 400 ppb Au (Figure 6.10). Of the 117 sites discrete grains of native gold were observed in concentrates at five localities in a cluster of samples around Stronchullin (Gunn et al., 1996). Only one site at Allt Mor east of Stronchullin recorded visible gold. The four other visible gold localities are within Coire Odhar, located 7 km to the southwest of Stronchullin.

The majority of Stronchullin samples were also enriched in As. Another cluster of high Au panned concentrate values (sporadic enrichment in As, Cu, Pb and Zn) occurs west and south-west of Meall Mór, in streams draining from Cnoc a Bhaaille and Stob Odhar (Gunn et al., 1996).





## Figure 6.9 British Geological Survey stream sediment geochemistry (Au) of the Knapdale area.





#### Figure 6.10 British Geological Survey panned concentrate geochemistry (Au) of the Knapdale area.



A total of 82 rock samples were collected by Gunn et al. (1996), 8 of which were collected within the Knapdale Property. These samples were either composite chip samples or channel samples collected across veins or alteration zones. The highest Au concentrations occur in quartz vein material collected from the historic dumps at the Stronchullin mine (8-22 ppm Au; Figure 6.11). No visible gold was observed. The quartz veins generally contain 2-3% sulphide (sphalerite and galena) with sulphide content varying from barren to up to 10% locally (Gunn et al., 1996).

Twelve rock samples were chosen for petrographic studies with the primary objective to locate gold grains and identify the mineralogy of each specimen (Gunn et al., 1996). No gold was observed in the vein samples, but fine gold was confirmed in a stratiform and breccia sample via an electron microprobe survey. Gunn et al. (1996) suggest the lack of gold in the Stronchullin vein material suggests a considerable 'nugget effect' in these samples.

# 6.3.2 Mineral Reconnaissance Program: Geophysics

Regional gravity and magnetic surveys were completed by the Government over the study area as presented in Figure 6.12 and Figure 6.13. The regional surveys were reviewed as part of a lineation study across the Property conducted by Gunn et al. (1996) and these authors documented potential structures for mineralisation. The authors of this Technical Report suggest that the regional gravity model shows a sharp northwest-trending break between low and high gravity occurs in the northern part of the Property (Figure 6.12), and the regional magnetic image displays a magnetic high area in the central part of the Property (Figure 6.13) that correlates with the gravity high.

# 6.3.3 Mineral Reconnaissance Program: Summary

The highest BGS reported gold values within the Knapdale Property occurs at Stronchullin with gold concentrations in mine dump samples yielding up to 22 ppm Au (Gunn et al., 1996). This mineralisation is characterized by high levels of As, Sb, Cu, Pb, Zn, and Ba and has elevated gold/silver ratios (Gunn et al., 1996). The highest within Property copper mineralisation occurs at Gossan Burn, which is located 2 km north of Abhainn Strathainn.

Gunn et al. (1996) discussed three distinctive styles of mineralisation based on their morphology, mineral parageneses and geochemical abundance patterns. Two of these directly apply to the Knapdale property. Firstly, mineralisation of syngenetic sedimentary exhalative origin is the most widely spread. This belt is 200-800 m wide and can be traced over a strike length of 10 km, it comprises the stratiform disseminated pyrite with minor chalcopyrite and sphalerite.

Secondly, the area of the Stronchullin mine comprises of orogenic auriferous quartz veins. This style of mineralisation is also characterized outside of the study area around Inverneil and Lock Arail and to the south in the Artilligan Burn and Erins areas. The veins have textural, morphological and geochemical features that are "comparable with other auriferous mesothermal veins found in Scotland and elsewhere" (Gunn et al., 1996).











Figure 6.12: Regional Government gravity surveys over the Knapdale Property.









# 7 Geological Setting and Mineralisation

# 7.1 Regional Geology

The Caledonian Orogeny comprises tectonic events that spanned over the Cambrian, Ordovician, Silurian and Devonian and is associated with the development and closure of those parts of the lapetus Ocean that were situated between Laurentia, Avalonia, Baltica and Gondwanaland (McKerrow et al., 2000; Dewey et al., 2014). The Scottish and Irish Caledonides form six terrane zones divided by major boundaries known as the: Moine Thrust Zone, Great Glen Fault, Highland Boundary Fault, Southern Uplands Fault, and lapetus Suture Zone. The terrane zones, along with their boundary fault/thrust zones, are presented on Figure 7.1, and include the:

- 1. Northwest Foreland with a Lewisian basement inliers,
- 2. Northwest Highlands consisting of the Moine Supergroup with Lewisianoid basement inliers and a Grenville overprint,
- 3. Colonsay/Islay Zone with a Ketilidian basement,
- 4. Grampian Highlands with a probable Grenvillean basement,
- 5. Midland Valley with an uncertain basement and
- 6. Late Ordovician to Wenlock Southern Uplands accretionary prism.

The Knapdale Project is in the Grampian Terrane between the Great Glen Fault and the Highland Boundary Fault. The Grampian Terrane is believed to have formed in two stages:

- Grampian I: Oceanic closure was followed by collision of ophiolites and magmatic arcs to the Laurentian margin to result in the ca. 485-465 Ma Grampian orogenic event (Lambert and McKerrow, 1976; Nelson and Casey 1979; Oliver et al., 2000; Dewey 2005; Chew et al., 2010; Cutts et al., 2011; Tanner, 2014). This event is generally interpreted as an Island Arc-Continent collision.
- Grampian II: Following a flip in subduction polarity and development of the Southern Uplands accretionary prism in Scotland and Ireland (Leggett et al., 1979; Stone and Merriman, 2004), renewed deformation and metamorphism at ca. 450– 445 Ma may correspond to terrane accretion (Bird et al., 2013). The tectonic driver behind the Grampian II is poorly understood and alternative models exist such as, for example, the flat-slab subduction model of Dewey et al. (2015). Flipping subduction, however, would not account for continued magmatism and crustal shortening in Grampians. For example, the Lagalochan porphyry emplaced at 423 Ma immediately post cessation of northwest-directed subduction and initiation of Great Glen strike slip faulting at 428 Ma.









The mid-Neoproterozoic to Early Palaeozoic Dalradian Supergroup comprises welldifferentiated sequences of variably metamorphosed marine clastic sedimentary rocks and meta-carbonate rocks, with some volcanic units. The rock package was deformed and metamorphosed to varying degrees during the mid-Ordovician Grampian Event of the Caledonian Orogeny (Stephenson et al., 2013). The diverse lithology, simple to locally complex structure and low-grade regional metamorphism (upper greenschist) of the Dalradian Supergroup, together with Caledonian intrusive igneous rocks form the Grampian Highlands bedrock (Figure 7.2).

The age of the base of the Dalradian is not known; however, the succession was not affected by Neoproterozoic orogenic events and therefore the Dalradian is not part of the Caledonian basement and its basal strata are likely younger than approximately 730 Ma (Smith 1999; Leslie *et al.* 2008; Stephenson et al., 2013; Dewey et al., 2014). The total thickness of the Dalradian succession is at least 25 km thick, although its complete stratigraphic thickness is never observed at one place.

The stratigraphic table and depositional environment of the Dalradian Supergroup is presented in Figure 7.3 (Stephenson et al., 2013). The lower Grampian and Appin groups fall within the Cryogenian System/Period and the two higher groups (Argyll and Southern Highland groups) fall mainly within the Ediacaran System/Period but extend into the Middle Cambrian Series.

The Argyll Group is differentiated from the underlying Appin Group by a basal chronostratigraphic marker horizon of tillite, and/or a sequence of tillites, that almost certainly were deposited beneath ice sheets during a glacial event of restricted duration. Rocks of the Argyll Group crop out over an area of some 5700 km<sup>2</sup>

The Islay Subgroup represents the oldest Argyll Group rock formation and in addition to the basal tillite, is dominated by local carbonate successions and by thick shallow water shelf and deltaic quartzites of regional extent.

The overlying Easdale, Crinan and Tayvallich subgroups are generally characterized by basin deposits, turbidites and unstable basin margin slump deposits, with only one widespread major shallow-water interlude, in the upper Easdale Subgroup. Individual beds in the Easdale and Crinan subgroups are not substantiated for any great distance. In contrast, uppermost Argyll formation, the Tayvallich Subgroup, is dominated by a calcsilicate and carbonate-rock unit, which forms another marker unit.

The Argyll Group is also characterized by penecontemporaneous volcanic rocks, which reach maximum activity in the Tayvallich Subgroup. The volcanic rocks have been dated by U–Pb on zircon at 600–595 Ma (Halliday et al., 1989; Dempster et al., 2002). Further evidence for tectonic instability comes from widespread stratabound exhalative mineralisation in the Easdale Subgroup, which includes economically significant sulphide and bedded baryte deposits near Aberfeldy (Stephenson et al., 2013).









Figure 7.3 Stratigraphic table of the Dalradian Supergroup with interpreted depositional environment, water depth and subsidence history (Stephenson et al., 2013). The upper Erins Quartzite transitions eastward to finer-grained garnet mica Crinan Subgroup schists (Stonefield Schist and Ben Lui Schist formations).





With respect to structural geology, the Grampian terrane is sandwiched between two crustal-scale sutures, the Highland Boundary Fault and Great Glen Fault. The structural development of the Grampian terrane has been subject to at least 4 major episodes of deformation including a pronounced early phase of recumbent nappe folding directed to the northwest and structures related to subsequent episodes of folding (Figure 7.4; Harris et al., 1978; Bradbury et al., 1979). The Knapdale district is separated from the remainder of the Grampian terrane by a major northwest-trending structure known as the Cruachan Lineament and this fault zone has implications for the composition and volume of extrusive and intrusive volcanic bodies on either side of the fault.

Large-scale structures within the southwest Grampian Highlands include major folds on either side of the early upward-facing Loch Awe Syncline (Figure 7.4). To the southeast in the project area, the Ardrishaig Anticline is interpreted as the core of a large southeast-facing nappe, the Tay Nappe, which dominates the overall structure of the south-eastern part of the Grampian Highlands and the Knapdale Property (Stephenson et al., 2013). The core of the Tay Nappe is structurally complex and includes steeply dipping strata such as the Knapdale Steep Belt (Roberts, 1974), exposes a portion of the Highland Boundary Fault and has a high-strain zone with several planes of dislocation termed the Boundary Slide.

At the Knapdale Property, the D4 Tarbert Monoform shown in Figure 7.4 results in the interfolded boundary that appears to be structurally related to the Stronchullin Au-Agbase metal deposit. Other geological associations at the Talbert Monoform that may factor in the regions mineral potential include metamorphic grades of upper Greenschist facies, a garnet isograd, and a distinct sulphide (pyrite) horizon known as the pyrite belt.

Pressure–temperature conditions of the garnet isograd in the Ballachulish area, southwest Highlands, are estimated to be approximately 7 kbar and 500 °C; in the absence of demonstrably higher pressure mineral assemblages or mineral compositions (e.g. paragonite), the pressures in the Tayvallich–Knapdale region may not be much, if at all, higher than the c. 7kbar estimate at Ballachulish (Dempster 1992; Pattison, 2013).

The pyrite zone, or pyritiferous schist, is a zone of stratiform sulphide mineralisation with a strike length of 10 km and width of approximately 200 m in the Upper Erins Quartzite. Pyrite is the dominant sulphide phase and forms up to 23% of the quartzite and 13% of the pelite. Occurrences of copper and anomalous chargeability have been directly correlated to the sulphide zone – and at Perthshire is documented to contain significant quantities of base metal and barite mineralisation of sedimentary exhalative origin (Coats et al., 1984).

Various lineation sets were identified for the Knapdale Property area using geophysical, geological, satellite and topography datasets (Gunn et al., 1996). Dominant orientations include northeast-southwest; east-west; and northwest-southeast. The east-west lineaments have spatial associations with enrichments in various trace elements including gold. Gunn et al. (1996) observed lineaments trending Azimuth 110° and 090° in the proximity of the Stronchullin Mine.



Figure 7.4 Regional bedrock geology map and cross-sectional slice to depict the structural geology of the region. The location of the Knapdale Property is included on both figures.





Erins Quartzite (upper) Fm.	GROUP	Colonsay Group	DALRADIAN ?	
Erins Quartzite (lower) Fm. Ardrishaig Phyllite Fm. EASDALE		Sheared unconformity Rhinns Complex	PALAEOPROTEROZOIC	10 km1



# 7.2 Property Geology

The bedrock geology in the Knapdale South parish and Knapdale Property has been documented by several authors (e.g., Peach et al., 1911; McCallien, 1926; Roberts, 1959; Smith et al., 1978; Gunn et al., 1996; Dempster et al., 2002; Tanner et al., 2013; Stephenson et al., 2013). The bedrock comprises middle Argyll Group rock sequences of the Easdale and Crinan subgroups and the lowermost Southern Highland Group (Figure 7.5). The geological map presented does not differentiate the Upper and Lower Erins Quartzites which are correlated with two Crinan and Easdale Subgroups, respectively.

A transect of the rock sequence from the villages of Tarbet to Ormsary (i.e., east to west) and from youngest to oldest includes:

- Beinn Bheula Schist, Glen Sluan Schist and Green Beds formations of the Southern Highland Group in the southeast.
- Stonefield Schist of the Argyll Group's upper Crinan Subgroup occurring adjacent to the Glen Sluan Schist Formation at the West Loch Tarbert.
- Metabasic sills that have intruded in a northeast orientation consistent with the overall tectonic fabric of the area and are most prevalent in the Erins Quartzite Formation (within the Knapdale Property area).
- Lower and Upper Erins Quartzite formations, equivalent to the Argyll Group's upper Easdale and Crinan subgroups, which dominant the bedrock geology at the Knapdale Property.
- Ardrishaig Phyllite and Stronchullin Phyllite formations, equivalent to the Argyll Group's middle to upper portion of the Easdale Subgroup; the phyllite is also prevalent at the Knapdale although proportionally less so than the Erins Quartzite.

Note that the Dalradian Supergroup formation nomenclature is different than what is presented in the stratigraphic table (Figure 7.3) but the general depositional environments are similar. That is, the middle to late Argyll Group rocks consist of shallowing marine deposits with marked lateral facies and thickness variation that were deposited in a series of synsedimentary fault-bounded basins. The overlying Southern Highland Groups is composed of turbidite deposits comprising greywacke-siltstone and sandstone.

This package of rocks begins within the middle Easdale Subgroup as the ocean environment transitions from a deep basin to shallowing tidal flat to low-energy shelf deposits. The Ardrishaig Phyllite Formation is characterized by grey-green calcareous phyllite with 1-2 m thick beds of quartzite and minor bands of metacarbonate rock (limestone) and are exposed on the south-eastern limb of the Kilmory Bay Syncline where they occupy the core of a major fold known as the Ardrishaig Anticline (Figure 7.4). The Stronchullin Phyllite Formation consists of sliver-grey to grey, locally calcareous mica schist with associated quartz-mica schist and phyllites. Dark graphitic phyllites crop out



in Upper Gleann de Leirg and in headwaters of Artilligan Burn. These schistose rocks are best exposed at Stronchullin Burn and Artilligan Burn (Gunn et al., 1996).

At Knapdale and on the southeastern limb of the Ardrishaig Anticline, a diachronous, predominantly quartzitic unit known as the Lower Erins Quartzite Formation replaces the upper part of the Ardrishaig Phyllite and has an apparent thickness of up to 5,000 m. This fold forms the anticlinal root of the Tay Nappe (Figure 7.4). The succession is comprised of medium- to coarse-grained immature quartzite with variable mica and feldspar. Harris et al. (1978) suggested the proximal and along-strike facies changes of this unit are related to fan-type turbidite sedimentation with subsidence controlled by the development and reactivation of basin-marginal faults.

The Crinan Grits are repeated as the Upper Erins Quartzite Formation on the southeastern limb of the Ardrishaig Anticline (Figure 7.4). This formation is like the Crinan Grits except that it contains a greater proportion of fine-grained quartzite. Grey-green, phyllitic pelites and semipelites occur locally and pebbly quartzites, usually graded, become prevalent toward the top of the formation.

The Upper Erins Quartzite and Lower Erins Quartzite are formations within two district subgroups of the Argyll Group (formerly Middle Dalradian). The Upper Erins forms part of Crinan Subgroup and the Lower Erins and Stronchullin Phyllite are part of Easdale Subgroup. This is a critical stratigraphic boundary with the Stronchullin Phyllite Formation acting as a major rheological contrasting rock unit within the stratigraphically overlying but structurally inverted Upper Erins Quartzite Formation.

The Argyll Group rocks are intruded by numerous basic sills that are now in the form of epidiorite sheets (Figure 7.5). These are particularly evident in the Ardrishaig Phyllite Formation and the Erins Quartzite Formation which are both intruded by sill-like layers of basic meta-igneous rock that are folded and deformed along with their host rocks. Minor 'green beds' of detrital volcanic material occur in the south-eastern parts of the Ardrishaig Phyllite and Lower Erins Quartzite formations, and numerous basic sills could be penecontemporaneous with sedimentation. The metabasic sills are hornblendic, generally fine-grained, and massive. Locally, they are coarser and more foliated and may contain hornblende crystals up to 1 cm in length (Gunn et al., 1996).

The Stonefield Schist Formation overlies the Erins Quartzite Formation and comprises garnetiferous mica schist and chlorite-albite schist with beds of quartzose schist and gritty schistose psammite (Gunn et al., 1996). The Southern Highland Group in the West Loch Tarbet area (Figure 7.5) is dominated by psammitic turbidites of continental provenance and were deposited within submarine fans on a subsiding continental shelf. The Glen Sluan Schist is predominantly quartz-mica schist, the Green Beds consists of a range of chloritic to epidotic green schist and the Beinn Bheula Schist includes fine-grained metagreywackes and schistose psammite.

Other rock types in the area include minor intrusions including post-Caledonian lamprophyres, tholeiitic Permo-Carboniferous dykes and Tertiary dykes.

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Figure 7.5 Detailed geological map of the Knapdale Property and area with mineral occurrences/deposits.



The Knapdale Property rock package is altered by upper greenschist facies metamorphism at biotite grade. The primary deformation is associated with a low-grade metamorphism resulting in the development of the primary cleavages where slates and phyllites belong to the chlorite zone. Petrographic thin section work conducted by Gunn et al. (1996) described evidence of low temperature alteration with feldspars being altered to micas and clays, hornblende to chlorite and late sulphide to oxides and hydroxides. There is a gradual increase in the intensity of the primary deformation from the Loch Awe Syncline south-eastwards into the Loch Tay Inversion where a later phase of regional metamorphism has resulted in the growth of biotite and garnet.

# 7.3 Mineralisation

# 7.3.1 Orogenic Vein-Type Mineralisation

The mineralisation at the Knapdale Project occurs in post-tectonic, structurally controlled quartz veins comprising either single veins with considerable vertical and strike continuity or occur locally as zones of stringers/veinlets and as possible suites of enechelon veins of more limited extent. Vein-style gold mineralisation is typified in the Knapdale Property at the Stronchullin and Allt Dearg prospects (Figures 7.6 and 7.7).

The quartz veins are hosted by middle Dalradian Supergroup metasedimentary rocks that include units of contrasting rheological characteristics, such as at the contact of quartzite and phyllite. More specifically, the quartz veins occur at the contacts between the Lower Erins Quartzite Formation (Argyll Subgroup), Upper Erins Quartzite Formation (Crinan Subgroup) and the underlying Stronchullin Phyllite Formation (Easdale Subgroup; Figure 7.5). Associated wallrock alteration is limited both in intensity and aerial extent and comprises an intense silica-sericite-pyrite assemblage generally extending 2-10 m from the vein structures and grades laterally into chloritic alteration. Auriferous quartz veins contain carbonate and either galena and sphalerite or pyrite and chalcopyrite as dominate sulphide assemblages, both pairings associated with sulphosalts (Gunn et al., 1996).

These veins display textural, morphological and geochemical features comparable to other mesothermal veins found in Scotland and elsewhere (Gunn et al., 1996). Outcrops of mineralised quartz veins are generally extensively leached with only minor visible sulphide and the development of limonite coated vughs after weathered sulphide. The auriferous quartz veins contain approximately 2-3% sulphide but vary locally from being barren to having more than 10% modal abundance of sulphide. The most common sulphides are galena and chalcopyrite. Sphalerite is localised. Pyrite is dominant in the southern portion of Stronchullin lode system and associated with high grade zones.

The mineralisation is characterized by elevated levels of Pb, Zn, Cu, As, Sb, Bi and Ag with an elevated Au/Ag ratio. For example, a rock sample from the Stronchullin spoil heaps. Sample RC843133 contained 66.4 g/t Au, 17.9 ppm Ag, 6,000 ppm Pb, 55,000 ppm Zn, 1,640 ppm Cu, 478 ppm As, 834 Sb, and 1,560 ppm Ba.



Figure 7.6. Photographs of the historic Stronchullin Mine, spoil heaps and gold-bearing quartz vein and veinlets.



Figure 7.7 Photographs of the Allt Dearg Quarry with sheeted quartz-sulphide veins.





The vein systems can exhibit considerable grade and physical variation along strike and are believed to record a complex history of repeated fluid mobilization along the controlling structures that result in multiple phases of brecciation, recrystallisation and veining. The Au-Ag-bearing quartz veins occur within upper greenschist facies conditions during the Grampian event of the Caledonian Orogeny and are outboard (and northwest) of the garnet isograd and a significant pyrite zone (Figure 7.8).

Gold mineralisation is believed to postdate peak metamorphism and the main deformational event, coinciding with a period of rapid uplift and extensional tectonics following orogenic collapse.

## 7.3.2 Stratiform Sulphide-Type Mineralisation

Stratiform, disseminated pyrite mineralisation occurs at the Knapdale Property. These occurrences typically comprise quartzite and micaceous quartzite with 1-2% disseminated pyrite and minor chalcopyrite and sphalerite. Early pyrite in 'veins' orientated subparallel to the metamorphic foliation is deformed in some samples while later cross-cutting veins are dominated by chalcopyrite with pyrite, galena and sphalerite (Gunn et al., 1996). Late stage alteration is present in all samples. The gold documented by the BGS is rich in Ag either as electrum or auriferous silver. The stratiform disseminated pyrite mineralisation is of syngenetic sedimentary exhalative origin.

At Meall Mór – Abhainn Strathainn, the Erins Quartzite Formation, comprises a pyritic zone with coarse, blebby chalcopyrite and other sulphides. It is associated with a varied silicate assemblage including garnet, epidote, chlorite, biotite, hornblende and sphene (Gunn et al., 1996). The deposit was historically mined for copper at Abhainn Srathain.

Formulation of a genetic model for this type of mineralisation is problematic. Historical mining was conducted at the margins of metabasaltic bodies, suggesting that the mineralisation may be partly volcanogenic in origin. Mohammed (1987) suggested the Meall Mór mineralisation involved pre-metamorphic hydrothermal processes in a shallow geothermal setting. The mineral phases present would also suggest that the rocks in the Meall Mór have been modified by later tectonic events (Gunn et al., 1996).

Low to medium grade gold enrichment has also been identified in association with discordant copper vein mineralisation in the Meall Mór area, in the vicinity of the former mine workings at Abhainn Strathainn. The mineralisation is distinguished by high contents of Cu, Ba, Zn and Ag and low levels of As, Sb, Bi and Pb.

Gold grains recovered in the Meall Mór – Abhainn Strathainn setting are generally enriched in Ag and Hg with the latter up to a 9 wt. % (Gunn et al., 1996). High Hg in gold grains has also been reported in the vein deposits hosted in Dalradian rocks at Cavanacaw in Northern Ireland (Cliff and Wolfenden, 1992) and at Calliachar Burn in the Scottish Highlands (Mason et al., 1991).



Figure 7.8 Detailed geology of the Stronchullin Au-Ag prospect showing the location of mineral occurrences, historical mine dumps and mineralised quartz veins within the Dalradian Argyll Group. The location of the garnet isograd and pyrite horizon are also shown with respect to Lorne Resources 2017-2018 Stronchullin drillholes.





# 8 Deposit Types

The Knapdale Gold Project is an early stage exploration project. The Dalradian Supergroup in Scotland and Northern Ireland is mineralised by gold, silver and copper at numerous localities, some of which are being commercially exploited (e.g., Omagh Mine, Northern Ireland). Potential deposit types for this geological environment include:

- 1. Vein-hosted orogenic Au mineralisation in which the Au-Ag quartz veins crosscut Dalradian metasedimentary rocks and are dated between Ordovician to early Devonian (Treagus et al. 1999; Rice et al. 2016); and
- 2. Volcanogenic stratiform massive sulphide deposits; for example, a stratiform pyrite horizon occurs for over 10 km strike length at the Knapdale Property and is associated with anomalous copper-zinc geochemistry (Gunn et al., 1996). The stratiform pyrite horizon is stratigraphically overlying, but structurally underlying, better grade copper mineralisation as at Gossan Burn or on Kintarbert Estate.

Accordingly, the following text summarizes geological models for orogenic gold deposits and massive sulphide deposits, and their methods for exploration at Knapdale.

# 8.1 Orogenic Gold Deposits

Orogenic gold deposits account for approximately 45% of Worldwide extracted gold (Phillips, 2013), not including the Witwatersrand (World's largest district, approximately 30% of gold extracted; Phillips and Powell, 2011). These deposits form in response to major orogenic events caused by accretion or changes in subduction direction or dip and are viewed as both sny- and post-orogenic in origin (Groves et al., 1998). Often these deposits form during short periods of extension during overall contractional tectonostructural events (Blewett et al., 2010). They are associated with continental marginal accretionary (oceanic-continental) and collisional (continent-continent) orogens.

Typically, orogenic gold deposits occur in granite-greenstone terranes and/or in terranes dominated by turbiditic (meta-sedimentary) rocks and are commonly associated with second- and third-order faults and shear zones (Vearncombe et al., 1989; Lawrie and Hinman, 1998). These deposits are characterized by a large range of metamorphic grade from pumpellyite-prenite to granulite facies; however, they are regularly found in low to mid-greenschist facies (Groves et al., 1998).

Long distance hydrothermal fluid migration is initiated and driven by subductionrelated thermal events, episodically raising geothermal gradients within the hydrated accretionary sequences (Groves et al., 1998). Thus, this fluid migration results in goldbearing quartz veins emplaced over a large depth range, which are further classified based on depth and temperature. Sub-classifications of orogenic gold deposits include: epizonal deposits form within 6 km of the surface at temperatures of 150° to 300° C, mesozonal deposits from at depths of 6 to 12 km and at temperatures of 300° to 475° C



and hypozonal deposits form at depths below 12 km and temperatures exceeding  $475^{\circ}$  C (Groves et al., 1998; Figure 8.1).

## 8.2 Besshi-type Massive Sulphide

Besshi-type deposits occur in mixed volcanic-sedimentary environments (Cox, 1986). Besshi-type deposits are relatively rare with only 68 Mesoproterozoic-Phanerozoic deposits out of some 1,105 copper-sulphide deposits worldwide (Dergatchev et al., 2011). Generally, these deposits form above subduction zones in back-arc settings at the mature stages of their development, mid-ocean ridges near the continental margin and in some cases within the intracontinental or marginal-continental rifts at the early stages of the division of continents (Dergatchev et al., 2011). Besshi-type deposits are commonly hosted by turbidite and pelite in rifted basins and oceanic regimes (extensional environments; Figure 8.1) that have been intruded by basaltic sills (Taylor et al., 1995). The deposit signature is generally copper-rich and may contain small abundances of lead and other lithophile elements.

In contrast to other volcanic-hosted deposits, many Besshi-type deposits form thin sheet like bodies of massive to well-laminated pyrite, pyrrhotite and chalcopyrite within thinly laminated clastic sediments and mafic tuffs (Cox, 1986); however, the characteristics of Besshi-type deposits vary considerably. Some Besshi-type deposits include: Besshi, Japan (Kanehira and Tatsumi, 1970), Motoyasu, Japan (Yui, 1983), Kieslager, Austria (Derkman and Klemm, 1977), Raul, Peru (Ripley and Ohmoto, 1977) and Matchless, Namibia (Killick, 2000). Slack (1993) expands the definition of Besshitype deposits to include deposits such as those in the Ducktown district, Tennessee, United States, and the large Windy Craggy deposit in British Columbia, Canada.

### 8.3 Methods for Exploration

The Knapdale Project area can be effectively explored using geophysical surveys, by prospecting and applying multi-element geochemical surveys, and finally drilling. Both orogenic gold and Besshi-type massive sulphide deposits are structurally controlled, sulphide-rich deposit styles. Therefore, methods such as detailed geological mapping in accordance with geophysical surveys such as time-domain electromagnetic and magnetic surveys are useful tools to identify potential structures that could host a deposit.

Stream sediment surveys are well documented given the well-developed dendritic drainage network. For example, at the Knapdale Property, drainage sampling has delineated a 15 km<sup>2</sup> area of anomalous Au-Ag-As-Bi-Cu-Pb-Sb geochemistry extending south-southwest from Stronchullin Mine to Coire Odhar, southeast towards Artilligan Burn or west to Cruach a' Phubuil ridge. Within the broad anomalous zone, two cohesive, contiguous, high priority anomalies have been defined at Allt Dearg, and Stronchullin. Additional anomalies occur at Eas Coire Odhar and Gossan Burn.

Defined exploration targets are then drill tested to delineate the extent and grade of the occurrence/deposit toward a potential mineral resource classification.

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Figure 8.1: Schematic representation by Groves et al. (1998) of crustal environments of hydrothermal gold deposits. Deposit styles are displayed in terms of depth of formation and structural setting.




## 9 Exploration

### 9.1 Exploration Work Conducted by Lorne Resources Ltd. Between 2014 and 2016

Lorne Resources initiated exploration in the Knapdale Property area in 2014 and the work continued at the Property – on a yearly basis – through to February 2018. Because the Knapdale Property is a proposed qualifying property for a Cassowary in connection with the Transaction, the authors have split the Lorne Resources exploration work into two separate sections of this Technical Report:

- Section 9.1 Lorne Resources exploration work between 2014 and 2016; and
- Section 9.2 Lorne Resources exploration work between 2017 and 2018.

The exploration work has been separated this way such that Cassowary can demonstrate and support its new public company listing qualifying work of no less than CDN\$100,000 of exploration expenditures on the qualifying property in the last 3 years.

The 2014-2016 exploration work presented in this historical work subsection focuses on a total of 940 samples that include various sample media: rock chip and trench rock channel samples, and panned concentrate, stream sediment and deep till/soil (and peat) samples as highlighted in Table 9.1.

# Table 9.1 Historical (2014-2016) multi-media geochemical sampling work completed by Lorne Resources at the Knapdale Property.

Sample Type	Number of samples	Year
Panned Concentrate screened at -10# (2 mm)	42	2014-2016
Stream Sediment screened at -100# (150 mm)	13	2015
Soil grid (Gossan Burn)	260	2016
Soil grid (Allt Dearg)	424	2016
Rock chip sample	162	2014-2016
Trench rock channel sample	39	2016
Tota	al 940	

The gold results of the 2014-2016 Lorne Resources exploration work are presented in a series of figures that are based on sample media type. These include:

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- Figure 9.1 Anomalous Au in panned concentrates occur at Allt Dearg and Stronchullin with anomalous samples at Gossan Burn and Coire Odhar.
- Figure 9.2 Au in stream sediment anomalies occur in the region between Allt Dearg and Gossan Burn.
- Figures 9.3 and 9.4 Two deep till/soil grids were completed near Gossan Burn (Figure 9.3) and Allt Dearg/Stronchullin (Figure 9.4). Gossan Burn yielded seven anomalous Au deep till/soil samples from 63-134 ppb Au including 584 ppb Au. Anomalous samples to a maximum 111 ppb Au were returned from the Allt Dearg grid.
- Figure 9.5 Of the 216 rock chip samples collected, 31 (14%) yield >2 g/t Au and up to 66.4 g/t. The majority of the high-grade Au samples were taken from quartz veins at Stronchullin and Allt Dearg. The Meall Mór area had a single high-Au sample (>2.1 g/t Au).
- Figure 9.6 Rock channel samples taken from trenches at Gossan Burn contained up to 24 ppb Au.

Based on the 2014-2016 exploration work, the strongest recorded gold mineralisation occurs in the northern portion of Property at Stronchullin and Allt Dearg as defined by gold assays and strong multi-element chalcophile element associations. At Stronchullin, a panned concentrate sample PC843452 from the Gleann da Leirg stream contained 4 grains visible gold and yielded: 86.2 ppm Au, 16.2 ppm Ag, 96.9 ppm As, 5.7 ppm Bi, 13.1 ppm Sb, 0.26 ppm W and 1.1 ppm Hg. The Au-Ag-As-Bi-Sb anomaly covers an area of approximately 15 km<sup>2</sup>. Rock samples from the Stronchullin mine dumps yielded up to 66.4 g/t Au and 17.9 ppm Ag (sample RC843133) from a massive white, coarse crystalline quartz vein with slivers of silica-sericite altered schist, <5% galena, <10% sphalerite, <1% chalcopyrite and arsenopyrite, and <1% pyrite.

At the Allt Dearg stream, 2 panned concentrate samples contained visible gold and >10% sulphide. Panned concentrate samples PC843396 yielded: 57.1 ppm Au, 26.2 ppm Ag, 40.3 ppm As, 19.8 ppm Bi, 6.9 ppm Sb, 0.26 ppm W and 0.9 ppm Hg. Rock chip sampling of new road cuttings west of Allt Dearg stream yielded anomalous values of Au-Ag-Cu-Pb-Zn-As from swarms of narrow (<0.5 m) quartz-sulphide veinlets. The veins occur in psammite and are accompanied by sericite-silica alteration with approximately 10%-15% sulphide mineralisation.

The Gossan Burn prospect is characterized by a well-defined deep till/soil anomaly with gold values between 63-134 ppb Au and up to 584 ppb Au. Copper mineralisation is evident in intensely hematite-silica-altered sericite schist host rocks with chalcocite, chalcopyrite, malachite and rare azurite. Two rock grab samples (RC843152, RC843251) yielded 40% Cu and 18.8 g/t Ag; and 27.7% Cu, 14.4 g/t Ag, respectively.















Figure 9.3 Gossan Burn deep till/soil grid Au distribution. Source: 2014-2016 geochemical surveys conducted by Lorne Resources.





Figure 9.4 Allt Dearg and Stronchullin deep till/soil grid Au distribution. Source: 2014-2016 geochemical surveys conducted by Lorne Resources.







Figure 9.5 Rock chip (Au) distribution throughout the Knapdale Property. Source: 2014-2016 geochemical surveys conducted by Lorne Resources.









### 9.2 Exploration Work Conducted by Lorne Resources Ltd. Between 2017 and 2018

During 2014 to 2018, Lorne Resources conducted annual exploration work at the Knapdale Property. A summary of the 2014 to 2016 exploration work is presented in Section 6.4. The 2017-2018 exploration work has been separated out into this section such that Cassowary can demonstrate and support its new public company listing qualifying work of no less than CDN\$100,000 of exploration expenditures on the qualifying property in the last 3 years. The 2017-2018 exploration work included several geochemical surveys and a diamond drill program.

In this section the authors present the results of a 119-sample program that included the collection of panned concentrate, rock chip, trench rock channel and water samples at the Knapdale Property (Table 9.2). In addition, a 10-hole diamond drilling program was completed at the Property to test vein mineralisation at the Stronchullin and Allt Dearg prospects. Note: The diamond drill program and drill core analytical results are outlined in the following Section 10.

Sample type	Number of samples	Year
Panned concentrate: Screened at 10# (2 mm)	1	2017
Rock chip sample	65	2017-2018
Trench rock channel sample	53	2018
Total	119	_

### Table 9.2 Summary of 2017 and 2018 exploration on the Property.

### 9.2.1 Panned Concentrate Sample Result

In 2017, a single panned concentrate sample was collected in a stream approximately 650 m due east of the historic Stronchullin mine workings (Figure 9.7). The sample was sent to the ALS Laboratory in Loughrea, Ireland for geochemical analysis and returned a value of 1,190 ppb Au.

### 9.2.2 Rock Chip Sampling Survey

Sixty-five rock chip samples were collected on the Property in 2017 and 2018, most of which targeted the south-southwest to north-northeast oriented auriferous quartz veins of the Stronchullin and Allt Dearg prospects. These samples were sent to the ALS Laboratory in Loughrea, Ireland for multi-element geochemical analysis. The analytical data yielded anomalous gold values approximately 1 km south-southwest of the historic Stronchullin mine workings. Assay highlights from this program are presented in Table 9.3. Three separate samples yielded up to 230 ppm Au and 181 ppm Ag, 7,410 ppm Cu and 24,100 ppm Zn.









Sample #	Prospect	Lithology	Au (ppb)	Ag (ppb)	Cu (ppm)	Zn (ppm)
RC844459	Stronchullin	Quartz Vein	230,000	181,000	389	19
RC844468	Stronchullin	Quartz Vein	24,600	105,000	2,100	6,970
RC844186	Stronchullin	Quartz Vein	21,900	40,900	2,660	4,840
RC844452	Stronchullin	Quartz Vein	17,800	79,400	3,410	30
RC844195	Stronchullin	Quartz Vein	15,950	7,110	3,340	24,100
RC844193	Stronchullin	Quartz Vein	12,450	26,600	160	10,800
RC843898	Stronchullin	Micaceous Quartzite	10,000	3,720	285	22
RC844152	Stronchullin	Quartz Vein	10,000	44,300	30	17
RC844165	Stronchullin	Quartz Vein	6,510	12,100	20	13
RC844451	Stronchullin	Quartz Vein	6,310	88,500	9	59
RC844166	Stronchullin	Quartz Vein	4,620	1,820	1,045	128
RC844467	Stronchullin	Quartz Vein	4,140	31,100	7,410	35
RC844196	Stronchullin	Quartz Vein	3,310	5,550	17	209
RC844175	Stronchullin	Quartz Vein	2,120	1,510	15	42
RC844194	Stronchullin	Quartz Vein	1,675	1,140	9	30
RC844155	Stronchullin	Quartz Vein	1,500	10,850	1,600	75
RC844151	Stronchullin	Quartz Vein	1,235	2,990	8	12

Table 9.3 Selected	analytical	geochemical	highlights	from	the	2017-2018	rock	chip
sampling program.		-						

### 9.2.3 Channel Sampling Survey

A trenching campaign was undertaken on the Property during September 2018 with an aggregate 320 m of trenches excavated to 0.50-3.50 m depth to bedrock, when possible. The trenches were dug via excavator and continuous bedrock channel samples were collected using a diamond saw to channel the sample material. If bedrock could not be reached, rock chip float samples in float were collected. Figure 9.8 below illustrates gold geochemical values for the collected samples.

At the Stronchullin prospect, 6 trenches (T1, T2, T3, T4, T4W, and T5) were completed at intervals over a 400 m strike length extending south-southwest from the historic Stronchullin mine and confirmed continuity of the quartz-sulphide-gold-silver vein between the drillholes completed in early 2018 (see Section 10). Apart from trench T1, all excavations penetrated bedrock and 41 channel samples were collected and submitted to the ALS Laboratory in Loughrea, Ireland for full multi-element geochemical analysis.









At Allt Dearg, 7 trenches (T1, T2, T3, T7, T8, T9, and T11) were sampled to determine the source of well-defined deep overburden, base of glacial till geochemical anomalies. Trenches T1, T2, T8 and T9 reached bedrock although only trench T2 uncovered silicasericite alteration and weak mineralisation along strike from the Allt Dearg East goldsilver-copper trial mine. A total of 12 samples were collected and shipped to the ALS Laboratory in Loughrea, Ireland for full multi-element geochemical analysis.

Assay highlights from the Stronchullin and Allt Dearg channel rock sampling programs are presented in Table 9.4.

Sample #	Prospect	Lithology	Au (ppb)	Ag (ppb)	Cu (ppm)
CH845448	Stronchullin	Muscovite-Biotie Schist	257	0.16	53.2
CH845428	Stronchullin	Quartz vein	217	0.32	14.3
CH845449	Stronchullin	Muscovite Schist	67	0.09	83.3
CH845440	Stronchullin	Quartzite	61	0.3	24.3
CH845445	Stronchullin	Quartz vein	57	0.73	68.8

 Table 9.4 Assay highlights from the 2018 channel sampling program.

During the QP's site inspection, the best developed mineralised shears occur in the road outcrop at a major flexure of the main Stronchullin vein which rolls from dipping 75° west at the mine site to 85° east in the outcrop. The quartz-pyrite vein is weakly mineralised with the hanging wall shear zone strongly developed with thin, anastomosing quartz stringers extending >3 m into the hanging wall and assaying to 0.5 m at 8.5 g/t Au.

The best bedrock exposure occurs on the scoured road surface. Here, the Stronchullin Phyllite Formation is poorly exposed to the southeast of the road section, but narrow, high-grade quartz-carbonate-base metal vein veins were located in a section of the gorge 50 m south of the road and intermittently as float from excavations to bury hydro-pipeline 20-25 m south of the road section. The extent of these sub-parallel veins is not known.

### 9.2.4 Preliminary Assessment of Rock Geochemical Survey Data

Gold, silver and associated pathfinder elements such as arsenic and antimony were evaluated using the rock grab geochemical database to investigate potential areas of mineralisation (Figure 9.9). Statistical methods outlined below were utilized to equally weigh each element, regardless of concentration to assess the historic (2014-2016) and recent exploration (2017-current) rock grab samples. The statistical method derived:

1. The mean of Au, Ag, As, and Sb for the data set. The Z-Ratio for these elements was derived by dividing the assay value of each element for a rock grab over the mean (this Z-Ratio represents the individual pieces of the pie charts presented in Figures 9.10 to 9.12).



- 2. Each Z-Ratio was assigned a Z-Factor by the following criteria:
  - Z-Ratio ≤ 3, Z = 1
  - 3 < Z-Ratio ≤ 5, Z = 2
  - 5 < Z-Ratio ≤ 10, Z = 3
  - 10 < Z-Ratio, Z = 4
- 3. The Z-Factor was then summed for the elements selected (Au, Ag, As, and Sb).

Anomalous Au in rock grabs is shown in Figure 9.9. This figure outlines three Au-Ag prospect areas within the Knapdale Property as denoted by black inset boxes for the Stronchullin, Allt Dearg and Gossan Burn prospects. The Stronchullin historical mine area displays an increased proportion of Au in the pie charts around the mine dumps (central cluster in Figure 9.10). Generally, this cluster has higher proportions of Au and Ag in comparison to all other pie plots (in comparison with ratioed Ag-Au-As-Sb).

In the northern portion of Stronchullin Figure 9.10, a cluster with high antimony and moderate to high arsenic is present. Some of the samples in this cluster contain high proportions of gold, in the northern part of the cluster. A southern Stronchullin cluster is dominated by samples with high arsenic that trends north toward, and into, the central Stronchullin mine-dumps cluster.

Rock grab samples at the Allt Dearg prospect (Ormsary North sub-property) contain high proportions of arsenic (in comparison with ratioed Ag-Au-As-Sb) with some localized areas of: 1) high Ag proportions in the east-central side of the main southern cluster; and 2) high Au and Ag proportions within the southern cluster (Figure 9.11).

The Gossan Burn prospect (Ormsary North sub-property), is characterised by high arsenic in rock grab samples with a few samples having minor Au and Ag enrichment (in comparison with ratioed Ag-Au-As-Sb). Directly south of this cluster and outside the Knapdale Property toward Meall Mór, samples become dominated by antimony.

While this geostastical method is useful, it only comprised of 4 elements (Au, Ag, As and Sb), and therefore, doesn't define the overall distinct mineralogical and geochemical zoning at the Knapdale Property that is summarized as follows:

- West Allt Dearg: Au-Ag-Cu-Bi-Te,
- East Allt Dearg: Au-Ag-Cu-Pb-As-Sb,
- Stronchullin Mine: Au-Ag-Cu-Pb-Zn-As-Sb, and
- Stronchullin South: Au-Ag-Fe-As-(Cu-Pb).



Figure 9.9: Rock grab sample gold values for the Knapdale property area. The three inset boxes relate to statistical representations of Au, Ag, As and Sb for the Stronchullin, Allt Dearg and Gossan Burn prospects as presented in Figures 9.10 to 9.12.























### 9.2.5 Water Monitoring Project

During October 2017, Lorne Resources commissioned EnviroCentre Limited of Glasgow, Scotland to establish the naturally occurring background levels of heavy metals and toxic elements (pre-drill program) at surface water locations around the Stronchullin Estate and northern portion of Ormsary Estate. Water monitoring was undertaken at 35 locations, the majority of which are in the Stronchullin Burn catchment.

The Stronchullin prospect has a unique water signature. pH values are generally neutral (5.51 to 7.07) with the highest pH's near the historical Stronchullin mine workings (6.51 to 7.07; Figure 9.13). The trace element water results are presented in Table 9.5. Anomalous values of metals were documented at several locations within the Stronchullin prospect area. Water samples SW5 and SW9 had the highest copper values at 3.2  $\mu$ g/l and 3.9  $\mu$ g/l Cu (Figure 9.14) and an anomalous trend of high Zn in water occurs in the Stronchullin prospect area with up to 17  $\mu$ g/l Zn (sample SW24; Figure 9.15).

Table 9.5 Trace element analytical results of the 2017 Knapdale Property water monitoring program.

ogram.														
Sample			Sb	As	Bi	Cd	Cr	Cu	Fe	Pb	Hg	Мо	Ni	Zn
ID	Easting	Northing	(ug/l)											
SW1	185131	679047	0.085	1.1	5.5	0.03	0.25	2.1	300	0.37	0.005	0.55	1.2	25
SW2	184643	679042	0.085	2.4	7.8	0.04	0.27	1.5	1200	0.45	0.005	0.55	1.6	13
SW3	184555	679086	0.085	1.4	4.0	0.015	0.125	1.3	790	0.58	0.005	0.55	1.6	7.1
SW4	184528	679176	0.085	1.0	2.7	0.015	0.25	1.0	1200	0.73	0.005	0.55	1.2	7.3
SW5	184256	678650	0.085	1.9	3.0	0.03	2.7	3.2	1100	9.2	0.005	5.0	3.5	22
SW6	184509	678323	0.085	6.8	1.3	0.03	0.59	1.5	2600	0.59	0.005	0.55	1.8	13
SW7	184061	678381	0.20	1.1	0.5	0.015	0.67	1.3	940	0.37	0.005	5.7	1.5	10
SW8	184114	678094	0.085	3.9	0.5	0.015	0.125	0.8	1500	0.55	0.005	1.7	0.9	7.0
SW9	184049	677959	0.085	1.7	2.0	0.015	0.41	3.9	820	0.59	0.005	2.7	1.4	17
SW10	183936	677932	0.085	1.8	0.5	0.015	0.125	1.4	870	0.60	0.005	0.55	0.9	7.0
SW11	183900	678004	0.085	3.1	0.5	0.015	0.125	1.3	1100	0.86	0.005	0.55	0.6	8.1
SW12	184020	679346	0.085	0.98	1.1	0.03	2.1	2.5	1600	11	0.005	2.3	3.5	24
SW13	183799	679180	0.085	5.1	0.5	0.015	0.28	0.7	4100	1.4	0.005	0.55	1.1	5.0
SW14	183385	679290	0.085	0.98	0.5	0.015	0.125	0.9	1400	0.85	0.005	0.55	0.9	6.4
SW15	183467	679413	0.085	2.7	0.5	0.015	0.125	0.2	3600	0.85	0.005	0.55	1.4	6.4
SW16	183095	679240	0.085	0.83	0.5	0.015	0.125	0.2	2200	0.70	0.005	0.55	0.9	5.3
SW17	183047	678978	0.085	1.2	0.5	0.015	0.125	1.0	990	0.60	0.005	0.55	1.1	6.7
SW18	183211	678726	0.085	3.7	0.5	0.015	0.125	0.5	2600	0.85	0.005	0.55	0.7	4.6
SW19	182965	678431	0.085	0.94	0.5	0.015	1.4	1.0	740	0.67	0.005	0.55	1.2	8.9
SW20	183097	677549	0.085	0.70	13	0.015	0.125	0.6	420	0.44	0.005	0.55	1.0	5.5
SW21	183041	677515	0.085	0.94	15	0.015	0.125	1.0	830	0.41	0.005	0.55	1.1	4.9
SW22	183289	677392	0.085	0.99	7.9	0.015	0.125	0.9	870	0.41	0.005	0.55	1.0	6.6
SW23	182854	676982	0.085	2.4	3.9	0.015	0.125	0.8	1000	0.60	0.005	0.55	0.25	6.1
SW24	182708	677124	0.085	1.0	3.4	0.015	0.96	1.8	330	2.3	0.005	1.8	1.8	17
SW25	182800	678911	0.085	0.61	3.8	0.015	0.125	2.1	410	0.42	0.005	0.55	1.0	6.0
SW26	182448	678514	0.085	1.3	3.0	0.015	0.125	0.6	3700	1.1	0.005	0.55	0.8	4.1
SW27	182266	678591	0.19	4.1	1.6	0.015	0.30	0.9	6800	1.1	0.005	6.5	1.3	5.4
SW28	182029	677930	0.21	0.87	3.0	0.015	0.125	0.4	3900	1.2	0.005	5.2	0.5	4.5
SW29	181939	677934	0.085	2.4	1.1	0.015	0.125	0.5	1500	0.47	0.005	1.5	0.7	7.1
SW30	181706	677444	0.085	1.5	1.1	0.015	0.125	0.2	3300	1.0	0.005	1.4	0.6	3.7
SW31	181472	677148	0.085	0.91	0.5	0.015	0.125	0.8	2000	0.31	0.005	0.55	0.8	7.1
SW32	181182	676915	0.085	0.49	0.5	0.015	0.125	0.4	970	0.22	0.005	0.55	0.8	4.0
SW33	180854	676645	0.085	1.4	0.5	0.015	0.125	0.8	4700	0.72	0.005	0.55	1.1	9.3
SW34	184955	679297	0.085	1.6	0.5	0.015	0.40	1.0	1900	0.83	0.005	0.55	1.0	9.3
SW35	185850	678380	0.085	0.24	0.5	0.015	0.125	1.7	190	0.17	0.005	0.55	0.25	5.4





















### 10 Drilling

Priority Drilling Ltd of Loughrea, Co. Galway, Ireland was commissioned to conduct the drilling at the Knapdale Property using a Marooka tractor mounted Atlas Copco CS14 drill rig. The upper 24-30 m of the drillholes was cored at PQ size (122.60 mm diameter) and reduced to HQ size (96.00 mm diameter) through to a designed depth of 75-150 m with the PQ drill string acting as casing for the HQ drill string. Digital downhole surveys utilized a ReFlex EZ-Trac multi-shot survey tool with downhole surveys measured every 3 m. Overall core recovery of the quartzite-dominated lithology was excellent averaging 96.3% recover on 710 geotechnical measurements.

The drill program was completed between 15 November 2017 and 2 February 2018. A total of 10 inclined diamond drillholes were completed at two separate Knapdale Property target locations: Stronchullin and Allt Dearg prospects in the Stronchullin and Ormsary North sub-properties (Table 10.1; Figure 10.1). The program originally called for 13 drillholes but the program was cut short due to weather and ground conditions during the Allt Dearg portion of the program. Collectively, the drill program intersected and cored a total of 1,216.0 m that included 751.5 m at Stronchullin and 464.5 m at Ormsary North (Table 10.1).

The purpose of the program was to test the continuity and grade of historically defined high-grade Au-Ag ore-veins in the vicinity of the Stronchullin Mine deposit and to test Au-Ag-Cu vein mineralisation at the Allt Dearg prospect. The main portion of the drill program was concentrated over a 500 m strike extension of the main lode structure in the vicinity of the historic Stronchullin mine workings.

A total of 261 core samples were collected for assaying. At this early stage exploration project, core sampling was selective and focused on obvious sulphide-bearing quartz veining and the adjacent wallrock where alteration (mostly silicification, sericite, chlorite and carbonate) was visible. In some cases, quartz, sulphide stringer zones as encountered in the hanging wall to the quartz vein intersected in hole SD17-2 were sampled, but a lower, footwall quartz-carbonate-base metal stringer zone was not sampled. Where Lorne Resources sampled quartz veins, they have included some amount of wallrock.

For example, at Stronchullin, 7 drillholes totaling 751.5m of drilling have been completed on the Stronchullin vein system between the original Stronchullin open cut in the north and holes SD17-4 and SD17-6 to the south. A total of 189 split core samples were collected and submitted for analyses. This represents a cumulative total of 255 m of core sampled or 34% of the total length drilled.

All assays were conducted on split core sample intervals that average 1 m in length. Upon review of the data by the authors, there were no drilling, sampling or recovery factors that could materially impact the accuracy and reliability of the results.



Reported mineralised intervals are not true widths. For example, around drillholes SD17-1, SD17-2, SD17-3, and the Stronchullin Mine, the main Stronchullin vein and general vein system strikes roughly north-south and dips 70°-80° to the west. Drilling was oriented and inclined such that veins were intersected at angles ranging from 45° to 60° to core axis.

## Table 10.1 Summary of the drillhole descriptions for the 2017-2018 drill program at the Stronchullin Gold Prospect.

#### A) Stronchullin

Hole	Easting (OSGB36)	Northing (OSGB36)	Collar elevation (m)	Azimuth (°)	Dip (°)	Depth (m)	Start date	End date	Diamond drill rig
SD17-1	184432	679107	44.0	80	-60	62.7	22-11-2017	25-11-2017	CT14
SD17-1A	184418	679106	46.0	80	-70	80.5	27-11-2017	30-11-2017	CT14
SD17-2	184429	679158	41.0	90	-60	122.9	02-12-2017	07-12-2017	CT14
SD17-3	184332	678939	78.0	110	-55	150	13-12-2017	18-12-2017	CT14
SD17-4	184089	678355	101.0	100	-55	74.9	09-12-2017	12-12-2017	CT14
SD17-5	184372	678918	73.0	290	-55	149.8	26-01-2018	01-02-2018	CT14
SD17-6	184077	678337	101.0	110	-60	110.7	02-02-2018	06-02-2018	CT14
					Sub-Total	751.5			

B) Ormsary

Hole	Easting (OSGB36)	Northing (OSGB36)	Collar elevation (m)	Azimuth (°)	Dip (°)	Depth (m)	Start date	End date	Diamond drill rig
OD17-1	182902	678088	225	110	-55	132	15-11-2017	20-11-2017	CT14
OD17-2	182773	677421	344	100	-55		Not drilled		CT14
OD17-3	182820	677373	345	100	-55	191.5	24-01-2018	24-01-2018	CT14
OD17-4	183102	677301	274	90	-60		Not drilled		CT14
OD17-5	182747	677144	357	280	-60	141	08-01-2018	14-01-2018	CT14
OD17-6	182619	677463	322	280	-55		Not drilled		CT14
					Sub-Total	464.5			

Total depth (m) 1216.0









Summary results of the drill program at the Stronchullin deposit are presented in Figures 10.2 to 10.5, Table 10.2 and detailed in the text that follows.

- The quartz veins are generally emplaced along tensional fracture/fault zones within the quartzites and quartz-mica schist wall rocks. There is also evidence for possible en-echelon vein development.
- At Stronchullin (n= 189 core samples), 9 samples returned gold grades over 2.5 g/t Au and 6 samples returned grades greater than 5 g/t Au. All the high-grade intervals are associated with sulphide-bearing quartz veins (Figure 10.2).
- The quartz veins braid and horsetail at significant flexures in the lode structures and are strongly developed in massive Upper Erins Quartzite Formation (rather than the underlying Stronchullin Phyllite Formation). Development of discrete Au-Ag mineralisation is manifested by strong quartz-chalcopyrite-galena-sphaleritearsenopyrite-stibnite associations as encountered in hole SD17-2 (Figure 10.3). Hole SD17-2 intersected a quartz-sulphide stringer zone toward the end of the hole which may indicate proximity to a deeper quartz lode hosted within the Upper Erins Quartzite Formation. The main Stronchullin lode flexes just north of the SD17-2 drill section where the strike changes from Azimuth 005° to 025°.
- Hole SD17-3 intersected a strongly developed main quartz-sulphide lode hosted by the Upper Erins Quartzite Formation with a high-grade quartz-chalcopyritepyrite vein encountered at approximately 3 m into the footwall (Figure 10.4). The veins diminish within the underlying Stronchullin Phyllite Formation but are expected to potentially redevelop within Upper Erins Quartzite Formation at depth.
- Arsenic and antimony are generally reliable indicators of gold mineralisation with values in the range 100-4000 ppm As and 200-2500 ppm Sb within quartz veins whereas copper, lead and zinc appear to be zoned and elevated veins.
- Two drillholes were also completed approximately 900 m south-southwest of the Stronchullin gold mine (Figure 10.1). The holes targeted high grade quartz-gold-base metal veins hosted within the Stronchullin Phyllite Formation that assay to 1.5 m at 25.2 g/t Au and 84.7 g/t Ag and are interpreted to represent the southern extension of the Stronchullin vein system. The veins are truncated by a Tertiary dolerite dyke that intruded along a pre-existing shear zone and may also have controlled vein emplacement. Holes SD17-4 and SD17-6 confirm the continuity of a braided quartz-gold-base metal lode structure that is inferred to be the southern extension of the Stronchullin lode. It is anticipated that the quartz veins could potentially be strongly developed within the Upper Erins Quartzite Formation that underlies the Stronchullin Phyllite Formation at this locality. It is encouraging that an increase in quartz-sulphide stringer development was noted within psammite toward the base of hole SD17-6 which may be indicative of proximity to a deeper lode structure (Figure 10.5).





Figure 10.2 Selected drill core assay results at the Stronchullin and Allt Dearg prospects.



Figure 10.3 Stronchullin Prospect – Drillhole Section SD17-2. Abbreviations: BMS – biotitemica schist; CMS – chlorite-mica schist; FLT – fault; MGB – metagabbro; SMS – sericitemica schist.





Figure 10.4 Stronchullin Prospect – Drillhole Section SD17-3 and SD17-5. Abbreviations: BMS – biotite-mica schist; CMS – chlorite-mica schist; FLT – fault; MGB – metagabbro; SMS – sericite-mica schist.





Figure 10.5 Stronchullin Prospect – Drillhole Section SD17-6. Abbreviations: BMS – biotitemica schist; CMS – chlorite-mica schist; FLT – fault; MGB – metagabbro; SMS – sericitemica schist.





Selected assay results, as presented in Table 10.2, include:

- Drillhole SD17-1: 13.70 g/t Au and 5.21 g/t Ag over 0.50 m.
- Drillhole SD17-2: 13.30 g/t Au and 32.00 g/t Au over 1.05 m.
- Drillhole SD17-3: 41.80 g/t Au and 262.00 g/t Ag over 0.55 m.
- Drillhole SE17-6: 9.52 g/t Au and 3.86 g/t Ag over 0.90 m. This hole also had two interesting core assay results of 0.54 g/t Au (at 79.80-80.20 m) and 1.06 g/t Au (81.00-81.25 m) with core lost in between the anomalous values (i.e., lost core at 80.20-81.00 m).
- Four out of five holes targeting the northern section of the Stronchullin Lode intersected sulphide within laminated quartz veins.

Drillhole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	As (ppm)	Sb (ppm)
	4.00	4.50	0.50	13.70	5.21		0.11	0.04	11	2
SD17-1	26.70	27.45	0.75	3.94	4.94	0.15	0.26	2.17	265	1325
	37.50	37.90	0.40	1.04	4.58		1.44	0.48	1490	2530
SD17-1A	51.15	52.25	1.10	1.60	2.84	0.10	0.49	1.37	742	712
SD17-2	61.00	62.85	1.85	1.39	1.42	165.00	646.00	0.89	122	212
3017-2	66.75	67.80	1.05	13.30	32.00	1.06	5.17	3.36	2910	1440
SD17-3	25.60	27.20	1.60	1.36	30.00	0.44	0.27	0.20	1590	1845
3017-3	31.70	32.25	0.55	41.80	262.00	3.50	0.54	0.08	3710	2580
SD17-4	24.35	26.00	1.65	1.10	1.05	0.02			24	14
3017-4	28.75	29.50	0.75	4.28	0.88		0.03	0.02	5	2
	38.40	39.75	1.35	1.05	0.16		0.02	0.02	28	7
	41.75	45.30	3.55	4.99	2.81	0.04	0.53			
SD17-6	44.40	45.30	0.90	9.52	3.86	0.07	0.60		175	64
3017-0	72.80	80.20	0.40	0.54	0.48				142	11
	80.20	81.00	0.80 *							
	81.00	81.25	0.25	1.06	0.86				4	1

Table 10.2: Selected analytical results of drill intercepts from Stronchullin drill program.

\* Denotes a zone of poor core recovery associated with the drillhole SD17-6 80.20 to 81.00 m interval.



With respect to the Ormsary North (Allt Dearg) drill program, the drilling program was limited to 3 drillholes (of the 6 proposed) due to snow cover on steep slopes. The completed drillholes (OD17-1, OD17-3 and OD17-5) were representative of second priority targets. To reiterate, the area of the historic copper-silver-gold mine at Allt Dearg East could not be safely accessed during the winter drill program.

Selected results of the reduced-scope Allt Dearg program are presented in Figure 10.6 and Table 10.3. While several quartz-sulphide veins were intersected in holes SD17-3 and SD17-5, gold values were uniformly <0.1 g/t Au. Drillhole OD17-5 yielded between 152.5 and 270.0 ppm Cu over an interval of 5.8 m. The copper interval occurs in dark grey highly foliated biotite schist with quartzite interbeds and silicified grey-mica schist with quartzite interbeds. The mineralisation included disseminated pyrite, pyrrhotite and chalcopyrite.

Additional ground and/or geophysical geological exploration work is proposed prior to undertaking further drilling based solely on the till geochemical anomalies.

Drillhole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)
	53.80	55.55	1.75	<0.005	0.13	124.5	26.0	162.0	53.7	2.20
	58.30	59.30	1.00	0.020	0.12	49.5	14.4	92.0	15.6	0.48
OD17-1	59.30	59.80	0.50	<0.005	0.12	66.2	15.6	150.0	12.8	0.61
	59.80	61.05	1.25	<0.005	0.12	57.6	26.7	138.0	5.4	0.29
	65.00	65.50	0.50	<0.005	0.11	58.6	40.2	133.0	26.8	0.39
	66.65	67.80	1.15	0.011	0.10	170.0	13.9	48.0	11.9	0.26
	63.75	64.50	0.75	<0.005	/	196.5	39.6	150.0	122.0	2.95
OD17-5	83.40	85.60	2.20	0.008	/	152.5	48.3	97.0	2.8	0.17
0017-5	85.60	86.70	1.10	<0.005	/	270.0	41.2	91.0	2.0	0.16
	86.70	89.20	2.50	<0.005	/	211.0	22.1	82.0	1.5	0.17
OD17-3	125.00	128.70	3.70	<0.005	/	62.9	19.8	285.0	16.3	1.27
0017-0	154.75	155.90	1.15	<0.005	/	92.6	12.9	81.0	35.5	4.73

#### Table 10.3 Selected analytical results of drill intercepts from Allt Dearg drill program.



Figure 10.6 Ormsary Prospect – Drillhole Section OD17-5. Abbreviations: BMS – biotitemica schist; CMS – chlorite-mica schist; FLT – fault; MGB – metagabbro; SMS – sericitemica schist.





## 11 Sample Preparation, Analyses and Security

### 11.1 Sample Collection, Preparation and Security

### 11.1.1 Geochemical Sample Collection: Deep Till/Soil, Stream-Sediment, Panned Concentrate, Rock Chip and Trench Rock Channel Samples

The rock sampling programs collected approximately 2-3 kg of rock chip and/or trench rock channel material by placing the sample in a pre-labelled calico bags (labelled with a unique sample identifier) and sealing the bag for transport to the laboratory. Prospecting programs utilized a variety of bedrock exposures including, but not limited to historical mine dumps, road excavations, natural bedrock exposures and boulder float material. Trenches were dug by excavator to 0.50-3.50 m depth to access bedrock, when possible. Continuous bedrock channel samples were collected using a diamond saw to channel the sample material. The channel samples consisted of 5-6 kg of material that was placed in pre-labelled calico bags. If bedrock could not be reached, rock chip float samples were collected.

Drainage sampling included stream sediment and panned concentrate sample programs. Stream sediment samples were collected at each site by wet sieving through 100# stainless steel, 300 mm sieves. The sediment was placed in pre-labelled plastic bags and dried at the field base prior to shipping to ALS.

Panned concentrates were collected by wet screening stream-sediment through a 10# stainless steel sieve. Approximately 4 litres of pan material were reduced through panning to a 30-40 g sample dependent on the amount of heavy minerals. The sampler conducted a visual estimation of gold and sulphide grains and heavy-mineral content. The panned concentrate was placed in a plastic bag, dried at the field base and shipped to ALS.

Deep till/soil samples were collected as part of a deep overburden survey that consisted of peat and glacial till. Samples were collected over on a 100 m x 20 m grid with infill sampling at 50 m x 10 m to better define anomalies generated during the initial survey. The sample was collected using an Atlas Copco Pionjar 2-stroke engine powered percussion jack hammer with flow through a gold sampling bit at end of the rod string. Maximum sample depth was 8 m. The sample material was placed in a pre-labelled kraft bag that was then placed in a secondary labelled plastic zip lock bag and shipped to ALS.

### 11.1.2 Water Samples

Water samples were collected by EnviroCentre Limited of Glasgow, Scotland, in appropriate sample containers at the predetermined sample locations as provided by Lorne Resources. The following procedure was adopted for all monitoring points:

• Locate sampling point using handheld Trimble TDC100 GPS unit.



- Rinse all bottles with stream water at sample point to minimize contamination (except for microbiological samples).
- Collect water samples in: 1L plastic bottles (x2), 200 ml amber glass bottles (x2) and a preserved sterile plastic bottle (x1).
- Collect field water measurements.
- Record stream water flowrate and water clarity.

In-situ field tests were undertaken using a Hanna Instruments HI98194 water quality monitoring probe; recording temperature, pH, electrical conductivity and dissolved oxygen. The field water quality monitoring probe was calibrated at the beginning of each working day on site.

The water samples were sent to Socotec UK Ltd (formerly ESG Scientific) and Derwentside Environmental Testing Services Ltd. of Durham, UK for analytical work.

### 11.1.3 Drill Core Samples

The drill cores were placed in plastic core trays and transported to Lorne Resources core yard at East Kames (south of Kilmelford Village). Drill cores were geologically and geotechnically logged, photographed, split by core saw and sampled by Lorne Resources geologists. The drill core was logged by recording all observed geological and geotechnical features on a specially prepared log sheet and a photographic record of all drill core was archived.

Mineralised sections of drill core were cut in half using a diamond saw and one half of the core was placed in a pre-numbered calico bag for dispatch to ALS Loughrea in Ireland for analysis of gold, base metals and a suite of trace elements. All assays were conducted on intervals of split core, on average 1m in length. The minimum and maximum sample lengths were 0.50 m and 3.0 m in wallrock lithologies.

Quality assurance – quality control (QA-QC) was monitored by incorporation of certified reference material standard samples and blank samples. The retained half of the cut drill core interval was retained for future reference in plastic core trays and stored at the Lorne Resources East Kames core shed. QA-QC is discussed further in Section 11.3.

### 11.1.4 Chain of Custody

Security measures taken to ensure the validity and integrity of rock/core/sediment/soil samples by Lorne Resources. The Company did this by transporting all geochemical deep till/soil, stream-sediment, and rock samples – which were bagged, tied, and labelled at the time of sampling – to their East Kames core yard. Here the samples were counted and verified against the field geologists field notes and exploration program database.



Sample allotments were then transported directly from East Kames storage facility to OMAC Laboratories Limited in Galway, Ireland (ALS Loughrea) for geochemical analysis.

The drill core was logged, sawn and sampled at Lorne Resources East Kames core yard. QA-QC samples were inserted randomly into the sample stream. The bagged, tied and labelled core samples were transported directly from East Kames to OMAC Laboratories Limited in Galway, Ireland (ALS Loughrea) for geochemical analysis.

### 11.2 Analytical Procedures

All Lorne Resources deep till/soil, stream sediment, pan concentrate, rock chip, trench channel, drill core samples and QA-QC sample blanks and standards (outlined in Sections 6.4, 9, 10 and 11.3 of this Technical Report) were analyzed at OMAC Laboratories Limited in Galway, Ireland (ALS Loughrea). ALS Loughrea is an independent, third-party chemical testing laboratory that follows ISO/IEC 17025:2005 (verified by the QPs).

Upon receipt of the samples, ALS Loughrea assigns a sample barcode that is logged into the proprietary laboratory information management system. Sample preparation (Code PREP-31B) entails crushing 70% of the sample to less than 2 mm. The crushed sample passes through a riffle splitter to separate 1 kg. The 1 kg sample is pulverized to better than 85% passing through a 75-micron screen. Excessively wet samples may require additional drying before preparation begins.

For Au in deep till/soil and stream sediment samples, the Code Au-TL44-MEPKG using a 50 g sample and aqua regia digest to measure Au (0.001-1ppm) and 41 trace elements. The panned concentrate samples were analyzed by Code Au-TL43-MEPKG using a 25 g sample and aqua regia digest to measure Au (0.001-1ppm) and 41 trace elements Aqua regia dissolves native gold as well as gold bound in sulphide minerals; however, depending on the composition of the deep till/soil, gold determined by this method may or may not match recovery from fire assay methods.

For gold in rock samples (grab, channel and core), the analytical package included Code Au-AA23 for trace level gold and Code Au-AA25 for ore grade gold. These analyses are completed via fire assay of a 30 g sample analyzed via Atomic Absorption Spectrometry (AAS) with a limit of detection ranging from 0.005-10.0 ppm (Au-AA23) and 0.01-100 ppm (Au-AA25). ALS Loughrea ensures an optimal fire assay flux recipe and rigorous quality control program that is capable of handling problem minerals such as chromite, base metal sulphide and oxide, selenide and telluride. For high grade samples a gravimetric finish (Code Au-GRA21) is required, which involves weighing the gold bead (LOD equal to 0.05-1000 ppm) after fire assay rather than measuring via AAS.

Multi-element analyses (Code ME-MS61) were completed using a four-acid digestion of a 0.25 g sample with an Inductively Coupled Plasma Mass Spectrometry (ICP-MS) finish. Four acid digestion quantitatively dissolves nearly all minerals in most geological materials. However, barite, rare earth elements (REE), columbite-tantalite and titanium,


tin and tungsten minerals may not be fully digested. Despite the potentially incomplete digestion of REEs the leachable portion of these elements may hold important exploration vectoring information and can be chosen as an analytical add-on.

Samples with high concentration of elements such as Cu, Ag, Pb and Zn underwent additional analysis to confidently measure concentrations. Over-limit analyses utilized the following analytical codes and ranges: Cu-OG62, 0.001-50%; Ag-OG062, 1-1,500 ppm; Pb-OG62, 0.001-20%; and Zn-OG62, 0.001-30%. The Cu, Pb and Zn analyses were completed on a 0.4 g sample using a four-acid digestion and ICP-MS finish. Silver was analyzed by Code HF-HNO3-HCIO4 digestion with HCI leach, ICP-AES or AAS finish. Four acid digestion breaks down most silicates and all but the most resistive minerals. These methods may be triggered automatically on multi-element geochemistry packages. Aqua regia is an effective solvent for copper oxides and sulphides, but copper occurring with other commodities like molybdenum can be analysed by four acid digestion for consistency across data sets. Trace level and low-grade silver samples may be analysed by acid digestion for maximum sensitivity and precision. Silver can suffer from nugget effect; occasional duplicate analysis may help detect sampling error at these low levels. At higher grades, fire assay with larger nominal weights may be preferable.

Water samples were submitted for the following suite of analysis: alkalinity; sulphate; phosphate; suspended solids; total petroleum hydrocarbons; turbidity; coliforms; e. coli; and trace metals (Sb, As, Bi, Cd, Cr, Cu, Fe, Pb, Hg, Mo, Ni and Zn). The metals analysis was conducted by Derwentside Environmental Testing Services Ltd. of Durham, UK. All other laboratory testing was undertaken by Socotec UK Ltd (formerly ESG Scientific).

Micro X-ray Fluorescence spectroscopy ( $\mu$ XRF) elemental data was acquired by Portable Spectral Services Pty Ltd. of West Perth, WA using a bench-top Bruker Nano Analytics 2D-micro-XRF spectrometer (Bruker M4 Tornado). The instrument has a 50kV 30-Watt Rh anode target, a 30mm<sup>2</sup> XFlash® silicon drift detector and poly-capillary optics that can focus a beam spot size down to 25  $\mu$ m. Sample location is recorded on two cameras (10x and 100x) enabling the precise location of the X-ray beam on the sample to be identified. Scan parameters used to acquire the elemental maps included a width of 1,438 pixels (143.78 mm); height of 523 pixels (52.34 mm) at 100  $\mu$ m pixel size for a total pixel count of 752,074 pixels. These qualitative element maps show the spatial variation and abundance of major, minor and trace elements. The  $\mu$ XRF can then quantify the data using the fundamental parameterisation method. Fundamental parameter algorithms can calculate the concentration of each element in weight percent, which is then normalised to 100%. The use of a fundamental parameter (FP) model can enable the collection of semi-quantitative data for heterogeneous samples.

## 11.3 Quality Assurance – Quality Control

Certified Reference Material (CRM) standards and blanks were used as a quality assurance and quality control (QA-QC) measure to assess and sample contamination of drill core samples analyzed at ALS Loughrea. Of the 278 samples submitted for laboratory analyses during the 2017-2018 drill program, a total of 17 samples (or 6.1%) included



QA-QC samples that were randomly inserted by Lorne Resources into the sample stream. The QA-QC CRM standard and blank samples include:

- Two rock standards, OREAS 504 (504 and 504b) and OREAS 502; and
- Two blank standards, OREAS 24b and 22c.

Duplicate core samples were not collected by Lorne Resources during the drill program and drill core sampling.

The CRM standards selected are classified as follows:

- OREAS 504, a porphyry copper-gold-molybdenum reference material.
- OREAS 502, an Au-Cu-Mo-Ag-S ore reference material.
- OREAS 22c, a quartz blank reference material.
- OREAS 24b, a granodiorite blank reference material.

The certificate of analysis for the standards was overseen by Ore Research and Exploration Pty Ltd. (ORE) of Baywater North, Australia. ORE is accredited to ISO 9001:2008 by Lloyd's Register Quality Assurance Ltd for its quality management system including development, manufacturing, certification and supply of CRMs.

The authors reviewed the QA-QC analytical data against the certified standards to provide an opinion on the nature, extent and results of the quality control procedures employed by Lorne Resources. The analytical results of the QA-QC work are discussed in the following text.

#### 11.3.1 Certified Reference Material Standard Results

Lorne Resources inserted 2 - OREAS 502 and 8 - OREAS 504 samples into the 2017-2018 drill core sample stream. The analytical results for Au, Ag and Cu are presented in Figure 11.1 (OREAS 502) and Figure 11.2 (OREAS 504). The standard samples have high precision (i.e., scatter) and high accuracy (i.e., closeness to specified value). Despite a limited number of samples, the analytical Au, Ag and Cu results versus the OREAS 502 standard yield contents that are close to the certified value (Figure 11.1).

Analytical Au, Ag and Cu versus the OREAS 504 standard represent a wider sampling of data and all measured values plot within two standard-deviation of the Certified Value (Figure 11.2).

It is the conclusion of the QPs that the overall standard samples had high precision and the accuracy of all standards is taken as reliable analyses.

12 June 2020



## Figure 11.1 Measured Au, Ag and Cu values from 2017-2018 drill core versus the Certified Reference Material OREAS 502.



A) Measured gold assays against the OREAS 502 certified standard.

B) Measured silver assays against the OREAS 502 certified standard.



C) Measured copper assays against the OREAS 502 certified standard.





## Figure 11.1 Measured Au, Ag and Cu values from 2017-2018 drill core versus the Certified Reference Material OREAS 504.



A) Measured gold assays against the OREAS 504 certified standard.

B) Measured silver assays against the OREAS 504b certified standard.



C) Measured copper assays against the OREAS 504b certified standard.





## 11.3.2 Blank Standard Results

Lorne Resources used blank standards comprised of quartz and granodiorite that were proven by round-robin analyses to assay below 5 ppb Au. Four samples of blank standard OREAS 24b and 3 samples of OREAS 22c yielded gold values of 0.01, 0.005 with all remaining samples below the minimum limit of detection (<0.005 ppm). The sample blanks have good distribution and the authors conclude the results, albeit limited to 7 samples, exhibit no evidence of sample contamination in the dataset.

## 11.4 Adequacy of Sample Collection, Preparation, Security and Analytical Procedures

The senior author has reviewed the sample preparation, analyses and security and found no significant issues or inconsistencies that would cause one to question the validity of the data and is satisfied with the adequacy of the procedures as implemented by Lorne Resources. Industry standards were maintained that are applicable to initial assessment of an early exploration stage project. The QA-QC blank results exhibit no evidence of sample contamination and the CRM standard results yielded high precision and accuracy.

It is recommended that future exploration programs at the Knapdale Property bolster their QA-QC protocol by increasing the number of QA-QC sample blanks and standards to at least 10% of the drill core samples. In addition, Cassowary should take duplicate samples and/or analyze duplicate pulp samples as part of the QA-QC stream. Finally, the duplicate pulp samples could be analyzed at primary and secondary laboratories. The objective of the additional QA-QC work is to increase the confidence level of the analytical results to potentially advance the Property toward a mineral resource classification.

## 12 Data Verification

## 12.1 QP Site Inspection

A site inspection was completed by Mr. Turnbull, P. Geo. on the Knapdale property from February 5-7<sup>th</sup>, 2020. The site visit included: a geological review of the Upper Erins Quartzite and the Stronchullin Phyllite formations; a field inspection of the Stronchullin gold prospect and the northern end of the Allt Dearg target area; and a review of 2017-2018 drill core from drillholes SD17-1,2,3,4 and 6 (Stronchullin) and OD17-1 (Allt Dearg).

## 12.1.1 Stronchullin Gold Prospect

The Stronchullin Gold prospect covers a north-northeast to south-southwest trending gold and base metal mineralised, shear hosted, vein system (vein-hosting structure). The vein hosting structure can be traced in outcrop and float for 1.8 km from Stronchullin Burn (river), south past the historic Stronchullin Mine and drillholes SD17-1,1a 2, 3 and 5, along a gravel road and various road cuts leading south to the Upper Gleann da Leirg area where drillholes SD17-4 and 6 were completed, approximately 900 m south-southwest of the historical Stronchullin workings.



The historical Stronchullin Mine is located less than 100 m south of the Stronchullin Burn (river) and is described as a 25 m long, 6 m deep north-south open cut. At the time of the field visit, the open cut was flooded, but the dimensions were consistent with the description provided. Vegetated waste dumps are accessible on either side of the open cut with abundant waste material that consisted of blasted, vuggy oxidized quartz vein material and altered psammitic quartzite and micaceous wall rock.

The vein hosting structure at the Stronchullin Gold prospect is comprised of either single veins with considerable vertical and strike continuity or as suites of en-echelon veins of more limited extent. The vein hosting structure and veins cross-cut bedding and schistosity in the dominantly psammitic Upper Erins Quartzite Formation and the underlying Stronchullin Phyllite Formation. The Stronchullin vein system is bisected and possibly offset by a late post-mineralization north-south fault/shear zone and tertiary dolerite dyke that has intruded along this fault structure, approximately 450 m southwest of the historical Stronchullin Mine workings.

Numerous shallow adits occur approximately 100 m north of the historical Stronchullin Mine site on trend with the main Stronchullin vein and at lower elevations, along the banks of the Stronchullin Burn.

## 12.1.2 Northern Allt Dearg

The Allt Dearg and Gossan Burn target areas were not reviewed in detail during the site visit, but the QP did review the northern end of the Allt Dearg area where drillhole OD17-1 was collared in a rock quarry approximately 2 km south of Stronchullin. The area is accessed from the north by a gravel road that runs initially east-west along the north side of Stronchullin Burn before turning to the south towards Allt Dearg. During the drive to the Allt Dearg Windfarm the site tour visited and sampled a long, south facing road cut north of Stronchullin Burn that exposed a large section of stratigraphy on trend with the Stronchullin vein system south of Stronchullin Burn. The northeast trending contact between the Upper Erins Quartzite and the Stronchullin Phyllite was observed.

The Stronchullin Phyllite Formation is highly weathered, foliated with a well-developed crenulation cleavage, localized folding of the bedding and outcrop scale, low angle reverse faults, consistent with the region's complex deformation history. There were numerous pinching and swelling micaceous bands which crosscut the foliation and bedding within Quartzite and Phyllite. Many of these micaceous bands contained various amount of narrow, sulphide bearing quartz veins.

## 12.1.3 Confirmation of Drill Sites

The QP verified several Stronchullin drill collar sites, which were clearly marked with labelled, white and red timbers. The drill casings had been removed so azimuth and dip could not be verified.



#### 12.1.4 Drill Core Review

A selection of the most significant gold intersections from drillholes SD17-1, SD17-2, SD17-3, SD17-4, and SD17-6 were laid out for inspection at a covered and secure core logging and archival facility (East Kames core yard). The original detailed drill logs for all drillholes were provided. Although the core review focused predominantly on the Stronchullin prospect, detailed geology (lithology, alteration, texture, mineralisation, oxidation) and geotechnical logs were produced and made available for all drillholes from the Knapdale project.

In the drill core that was laid out for the site tour, the QP examined the specific drill core sample intervals that returned high gold grades and in almost every case the highest-grade vein intercept contained a significant amount (>1%) of sulphide mineralisation. Although there were some high-grade gold intercepts in the quartz veins and stringer zones, the gold grades diminished away from the vein zone in the adjacent altered wallrock.

Sulphide mineralisation observed in core included galena, sphalerite, pyrite, chalcopyrite, and minor pyrrhotite, arsenopyrite and stibnite. Typically, intersections of laminated sulphides returned the best gold values. Four of the 5 drillholes targeting the northern section of the Stronchullin vein system intersected base metal sulphides within laminated quartz veins.

Host rock comprised variably altered Upper Erins Quartzite and Stronchullin Phyllite with sparse sulphide (mainly pyrite) mineralisation.

## 12.1.5 QP Site Inspection Samples and Analytical Results

Eight samples were collected during the site inspection. The samples were collected by a consulting geologist, Frederic Bolton, under the direction of Mr. Turnbull P. Geo. The sample numbers, locations and descriptions are presented in Table 12.1 and Figure 12.1. Rock sample lithologies included quartz vein material, quartz with micaceous wall rock and phyllite schist with variable amounts of sulphide (none to 2%; pyrite, galena and chalcopyrite).

The rock samples were stored with Mr. Bolton in Cheltenham U.K., and once the RTO was enacted, the samples were sent to OMAC Laboratories Limited in Galway, Ireland (ALS Loughrea). The same lab used by Lorne Resources and an independent, accredited third-party laboratory. The QP samples were analyzed using the same analytical codes as the lab work conducted by Lorne Resources in 2018.

The purpose of the QP sampling was to investigate a variety of rock types at the Stronchullin prospect including historical mine dump float (discarded ore), sulphidebearing and barren quartz veins, and country rock (e.g., phyllite). The analytical results of the QP samples are presented in Table 12.2 and show a clear association between mineralised and non-mineralised samples as described in the text that follows.



# Table 12.1 Summary descriptions and analytical results of the Qualified Person samplescollected during the February 2020 site inspection.

Sample ID	Rock Type	Sample Type	Easting (OSGB36)	Northing (OSGB36)	Sulphide (%)	Sulphide type	Description
BDG-ST-GB-1	Quartz (possibly barren E-W trending vein)	Grab from outcrop	184450	679055	None	None	Massive WSW-ENE qtz/carb vein. Slight red/orange weathering along fractures. No visible sulphide - sampled to confirm if E-W veins are barren.
ST-GB-2	Phyllite	Grab from outcrop	184450	679055	<0.5%	Pyrite, chalcopyrite	Finely laminated, schistose, micaceous rock unit (wallrock in shear zone adjacent to qtz veins). Trace sulphide associated wth minor narrow qtz carb veinlets.
GB-ST-03*	Sulphide bearing quartz veins with micaceous wallrock	Blasted rock from waste dump - not in place	184457	679104	1-2%	Pyrite, galena	From Stronchullin Mine waste dump. Qtz/carb vein with laminated sulphide and micaceous wallrock (couple of thin veins 2-3 mm thick). Some oxidaton (oxidized vugs) of sulphide.
GB-ST-04*	Sulphide bearing quartz veins with micaceous wallrock	Blasted rock from waste dump - not in place	184457	679104	<1%	Pyrite	From Stronchullin Mine waste dump. Qtz/carb veins split within included micaceous wallrock, minor dissemnated pyrite. Red colourization (hematitic staining) of fractured qtz.
BDG-GB-ST-05	Qtz Vein	Grab from outcrop	184429	679296	None	None	In cutting above the Stronchullin Burn adit. Sample of bluish-grey quartz vein and micaceous wallrock. Highly weathered and oxidized, hematitic staining on fractures. No visible sulphide, but some rusty vugs. Vein seems barren and massive with some vugs.
BDG-GB-ST-06	Sheared phyllite	Grab from outcrop	184307	679309	None	None	100 m W of sample BDG-GB-ST-05. Fine grained, micaceous, laminated rock (possibly Stronchullin Phyllite Formation?). Heavy and brittle grab sample. Red weathering along laminations and foliation planes. No visible sulphide.
BDG-GB-ST-07	Qtz vein hosted in phyllite	Grab from outcrop	184307	679309	None	None	100 m W of sample BDG-GB-ST-05. Semi transluscent, white-blueish grey, qtz/carb vein, vuggy and oxidized.
BDG- GB-ST-08*	Sulphide bearing quartz veins	Blasted rock from waste dump - not in place	184457	679104	2%	Galena, pyrite, chalcopyrite	From Stronchullin Mine waste dump. Vuggy, coarse grained qtz/carb vein with thinly laminated sulphide, with one larger blob of sulphide approximately 1 cm thick. Mostly galena with minor pyrite and chalcopyrite.

\* Float sample (i.e., not collected from outcrop).









	Au-AA23	ME-MS61							
	Au	Ag	As	Ba	Bi	Sb	Sr	Те	w
Sample ID	ppb	ppb	ppm						
BDG-ST-GB-1	bmld	10.0	17.0	20.0	0.2	1.4	1.8	bmld	19.4
ST-GB_2	5.0	80.0	16.5	1,270.0	0.2	1.3	50.2	bmld	5.6
GB-ST-03	9,860.0	2,290.0	325.0	1,810.0	0.2	330.0	204.0	0.13	6.5
GB-ST-04	28.0	180.0	54.8	790.0	0.1	100.5	1,075.0	bmld	12.5
BDG-GB-ST-05	bmld	90.0	7.7	70.0	0.3	4.7	53.2	bmld	4.7
BDG-GB-ST-06	bmld	40.0	0.4	450.0	0.3	0.2	142.0	bmld	2.0
BDG-GB-ST-07	bmld	10.0	0.5	50.0	0.1	0.1	11.8	bmld	0.9
BDG-GB-ST-08	7,670.0	1,600.0	52.6	1,670.0	0.3	260.0	563.0	0.06	43.7

 Table 12.2 Analytical results of rock samples collected during the Qualified Person site inspection. Two samples from the Stronchullin mine dumps are highlighted in grey.

ME-MS61 ME-MS61 ME-MS61 ME-MS61 ME-MS61 ME-MS6	1 ME-MS61 ME-MS61 ME-MS61
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	Со	Cu	Ni	Pb	Th	U	V	Zn	Zr
Sample ID	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
BDG-ST-GB-1	0.3	6.6	1.6	9.4	0.1	bmld	3.0	8.0	bmld
ST-GB_2	16.9	52.5	35.2	29.7	16.9	4.1	89.0	140.0	287.0
GB-ST-03	1.6	956.0	4.5	766.0	2.3	0.6	80.0	3,410.0	32.5
GB-ST-04	26.7	160.0	26.8	27.8	4.7	1.8	214.0	137.0	153.0
BDG-GB-ST-05	9.1	20.4	6.2	39.9	2.1	0.5	24.0	8.0	4.8
BDG-GB-ST-06	14.7	40.0	22.0	15.5	17.5	5.2	64.0	106.0	65.1
BDG-GB-ST-07	1.1	3.4	2.0	1.9	1.3	0.3	7.0	10.0	5.1
BDG-GB-ST-08	3.7	288.0	4.5	610.0	0.8	0.5	33.0	6,270.0	28.2

bmld - below minimum limit of detection

The analytical results of the QP samples shows there is significant high-grade gold in vein material collected at the waste dump, which although not in place, does confirm the grade gold potential observed in the drilling and in outcrop. Samples GB-ST-03 and BDG-GB-ST-08 yield elevated Au-Ag (7.7 to 9.9 ppm Au and 1.6 to 2.3 ppm Ag) and associated hydrothermal fluid pathfinder elements (As, Ba, Sb, Te and W). Interestingly, the results show a correlation between Au-Ag and tellurium (Te), which is documented at the Cononish Au-Ag deposit and representative of early, cryptic magmatic processes (Spence-Jones et al., 2018). These samples of sulphide-bearing quartz veins with micaceous wall rock also have elevated base metal elements that include: 288 and 956 ppm Cu, 610 and 766 ppm Pb and 3,410 and 6,270 ppm Zn.

In contrast, sample BDG-ST-GB-1 confirmed the Lorne Resources geologist's perception that the east-west trending quartz vein was barren of gold and emphasizes the importance of prospecting for sulphide-bearing quartz vein material for metal content. The micaceous phyllite wall rock sampled (GB-ST-02) does not contain gold mineralisation and confirms what the work to date has demonstrated (i.e., the Stronchullin prospect – at surface – is predominantly a vein hosted occurrence).

To conclude, the QP bedrock and float grab samples unequivocally demonstrate the Au-Ag and base metal potential of the Stronchullin prospect from an independent QP perspective.



## **12.2 Data Verification Procedures**

Cassowary provided a complete database of Lorne Resources exploration work that included, for example, digital files of geochemical survey descriptions, drill collars, drill logs, and analytical results. To verify these data, staff from APEX (under the direct supervision of Mr. Eccles) validated:

- Drill log files for their completeness and representation of the appropriate rock units.
- The number and quality of the geochemical assay data from the deep till/soil, stream sediment and rock chip and sample analysis and drill core sampling programs by re-compiling the overall dataset and checking the analytical results against the independent and accredited laboratory certificates.
- The exploration work conducted by Lorne Resources was also reviewed in the context of observations and analytical results as documented in historical work that was conducted by the British Geological Survey.

In addition, Mr. Eccles confirmed that ALS Loughrea and Derwentside Environmental Testing Services are independent, third-party, accredited chemical testing laboratories.

Finally, Mr. Turnbull as part of a 2020 QP site inspection verified the original detailed drill logs (as provided by Lorne Resources) versus the laid-out sections of drill core during the site inspection. Mr. Turnbull also verified the drillhole collar locations in the field versus the drill log coordinates.

## **12.3 Validation Limitations**

The Knapdale Property database provided to the authors is categorized as complete, largely in digital format, and in excellent condition. Some reformatting of Lorne Resources drill log lithologies will be required if Cassowary completes the recommendations provided in Section 26 and advances the Knapdale Au-Ag Project to the resource estimation stage where a three-dimensional geological model with Au-Ag-Cu lode domains is required.

The authors recommend that Cassowary bolster its QA-QC protocols if future exploration work is conducted. This would include insertion of additional standards and blanks, and the inclusion of duplicate sample/pulp analyses. It is also advisable to adopt a secondary independent laboratory to advance the confidence level of the data and project in general.

Lastly, the QPs recommend that Cassowary adopt sampling protocols that collect and assay drill core samples from the top of the drillhole to the end of hole. Sample intervals should be no less than 2 m in average length. This methodology is recommended to improve the overall geological model for resource evaluation and to test potential mineralisation in non-quartz vein dominate stratigraphy.



## 12.4 Adequacy of the Data

The QPs have reviewed the adequacy of the exploration information and the visual, physical, and geological characteristics of the property and has found no significant issues or inconsistencies that would cause one to question the validity of the data.

The senior author is satisfied to include the exploration data including geochemical surveys and drill information in this geological introduction and qualifying Technical Report. It is the QPs opinion that WGE (via Lorne Resources) has completed more than CDN\$100,000 of exploration work over the last 3-years.

## 13 Mineral Processing and Metallurgical Testing

In May 2020, WGE commissioned Portable Spectral Services Pty Ltd. of West Perth, WA to perform Micro X-Ray Fluorescence spectroscopy ( $\mu$ XRF) of high-grade mineralisation at Stronchullin (sample RC844459). The two-dimensional element maps provide detailed information about the spatial variation and concentration of major and minor elements within the sample. These maps provide insight into elemental and mineral associations, micro textures, element liberation and mineral genesis.

The ability to combine various elements to identify elemental associations and chemical zoning within minerals is important for the identification of mineral textures and chemical variability. For example, the mineralogical components within sample RC844459 was mapped by  $\mu$ XRF and is presented in Figure 13.1. The sulphide phases were identified to consist of predominantly pyrite followed by galena and small areas of chalcopyrite. The largest gold grain observed by the XRF scan is 600 microns (0.6 mm) and the bulk of the grains are <100 microns in size.

Selected 2-D element distribution maps, which display the element abundance of the element on a pixel-by-pixel basis, are presented in Figure 13.2. The sample, RC844459, was analysed on an elemental basis to determine if the gold and silver at the Stronchullin deposit are associated with sulphide. The gold element map, gold overlaid with silver element map and gold overlaid with sulphide element map show:

- Silver is strongly associated with the gold as electrum grains (compare Figure 13.2a and 13.2b); and
- Gold has an unequivocal correlation within the sulphide phase, which is dominantly pyrite (Figure 13.2c; Perring, 2020).

The  $\mu$ XRF results also identified that gold and electrum occur with pyritic bands in a laminated quartz vein with associated galena and chalcopyrite, and trace arsenic, antimony and bismuth.









Figure 13.2 Selected two-dimensional Micro X-Ray Fluorescence spectroscopy element distribution maps showing the association of gold, silver and sulphide.

- A) Two-dimensional element distribution map of gold (yellow).
- B) Two-dimensional element distribution map of gold (yellow) overlaid with silver (light blue).
- C) Two-dimensional element distribution map of gold (yellow) overlaid with sulphide (dark blue).



Au-LA, Date:9/06/2020 2:30:36 PM Image size:398 x 398 Mag:0x HV:0.0kV



Au, Ag map overlay, Date:9/06/2020 1:50:21 PM Image size:398 x 398 Mag:0xHV:0.0kV

AL S Au, S map overlay, Date:9/06/2020 1:50:21 PM

Au, S map overlay, Date:9/06/2020 1:50:21 PM Image size:398 x 398 Mag:0xHV:0.0kV



## 14 Mineral Resource Estimates

The Knapdale Au-Ag Project is an early stage exploration project and no mineral resource modelling and/or resource estimation work has been conducted.

# Note: Sections 15-22: The Knapdale Au-Ag Project is an early stage exploration project and Sections 15-22 are not required in this Technical Report.

## 23 Adjacent Properties

A summary of the current Crown Estate Lease Options – along with other mineral projects – in the Knapdale Property area is presented in Figure 23.1. The figure shows there are active Lease Options throughout the Grampian terrane and Dalradian Supergroup metasedimentary rock package. Detail on the Option Lease designated holders, and specific commodity of interest, is not provided by the Crown Estate Scotland but is available on the Scotgold Resources Ltd. and Greenore Gold company websites. Both companies are focused on identifying high potential gold prospects in Scotland.

As documented, the Knapdale South Option Agreement occurs within WGE's Property area and the current Lease Option is held by Scotgold Resources Ltd. (Scotgold; Crown Estate Scotland, 2020). The Crown grant to Scotgold, however, does not affect Au-Ag exploration at the Stronchullin and Ormsary North sub-properties in the Knapdale Project because Au-Ag at these sub-properties are subject to a Crown Charter 1907 (see Section 4.2.2).

## 24 Other Relevant Data and Information

None to report.

## 25 Interpretation and Conclusions

## 25.1 Property Summary and Adequacy of Exploration

The Knapdale Au-Ag Project is an early stage exploration project that comprises three contiguous sub-properties (Stronchullin, Ormsary North and Ormsary South) that total 3,253 ha. Prospecting Agreements to these sub-properties were originally acquired by Lorne Resources and include a Crown Charter 1907 rights to gold and silver at Stronchullin and Ormsary North sub-properties.

It is proposed that the exclusive Prospecting Agreements will be 100% owned and operated by Cassowary following the acquisition of WGE and its subsidiary, Lorne Resources, pursuant to the Transaction.









Consequently, Cassowary will own the rights to all data associated with Lorne Resources 2014-2018 exploration programs at the Property. The exploration work and associated datasets relate to multiple deep till/soil, stream-sediment, panned concentrate, rock grab and trench rock sample surveys (n=1,059 total samples) and a 2017-2018 drill program that drilled 10 drillholes. Collectively, the drill program intersected and cored a total of 1,216.0 m that included 751.5 m at the Stronchullin and 464.5 m at the Ormsary North sub-properties (Stronchullin and Allt Dearg prospects).

The QPs have reviewed the adequacy of the exploration information and the visual, physical, and geological characteristics of the property and has found no significant issues or inconsistencies that would cause one to question the validity of the exploration work or the resulting data. It is the authors opinion that WGE (via Lorne Resources) has completed substantially more than CDN\$100,000 of exploration work over the last 3-years.

#### 25.2 Summary Results and Conclusions

The Knapdale Au-Ag Project is considered prospective for the discovery of highgrade, orogenic style gold-silver mineralisation and volcanogenic stratabound massive sulphide deposits. The Au-Ag (and Cu) mineralisation is hosted within the Neoproterozoic Dalradian Supergroup metasedimentary rocks and associated with Caledonide orogenesis tectonostructural events.

The Knapdale Property and geology has several observed characteristics that appear to be important controls on the development of the orogenic style high-grade gold-silver veins and massive sulphide-type deposits in the southwest Grampian Highlands of Scotland as follows:

- Auriferous quartz lodes are generally hosted by Neo-Proterozoic Dalradian Supergroup metasedimentary rocks with host rocks associated with Argyll Group Easdale and Crinan subgroups (see Figures 7.4 and 7.8).
- Competency contrasts at the boundary between the phyllites and schists of the Easdale Subgoup and stratigraphically overlying but structurally underlying Crinan Subgroup quartzite marks a favourable zone for quartz vein development.
- The quartz lodes are developed within the inverted southeast limb of the recumbent D1-D2 Ardrishaig Anticline where secondary D3-D4 fold structures such as the Tarbert monoform are superposed on the earlier fold structures (see Figure 7.4).
- The auriferous quartz veins are situated within metasedimentary rocks of Upper Greenschist metamorphic grade and the strata are situated between the biotite and garnet metamorphic isograds (see Figure 7.8).



- Reducing rocks such as the Stronchullin Phyllite and St Catherine's Black Shale units within the Easdale Subgroup may be create favourable redox environments for the precipitation of metals.
- A pyrite zone, or pyritiferous schist zone, of stratiform sulphide mineralisation occurs within the Upper Erins Quartzite and is documented to contain significant quantities of base metal and barite mineralisation of sedimentary exhalative origin in the Grampian terrane possibly providing a metal source for later orogenic gold and base metal veins.
- Gold grains mapped by the micro-XRF technique showed that the grain morphology is similar to visible gold collected in panned concentrate samples, which indicates a potential local source of visible gold observed in the stream heavy mineral concentrates.

Early stage exploration and prospecting work at the Knapdale Property has identified auriferous quartz veins and quartz stringer zones that are generally emplaced along tensional fracture/fault zones within the quartzite and quartz-mica schist wall rocks and at the contact between the Upper Erins Quartzite and the Stronchullin Phyllite. The veining tends to horsetail at significant flexure points that correlate with, for example, undulations/folds within the contact zone of the units. There is also evidence for possible en-echelon vein development.

The higher-grade Au-Ag mineralisation (>10 g/t Au) is invariably associated with quartz veins that contain approximately 2-3% sulphide and locally up to more than 10% sulphide. The most common sulphide includes pyrite, galena, chalcopyrite, and locally, sphalerite (at the Stronchullin prospect).

In addition to orogenic vein mineralisation, copper dominant, stratiform, disseminated pyrite mineralisation is documented in the eastern portion of the Knapdale Property within intensely hematite-silica-altered sericite schist host rocks with chalcocite, chalcopyrite, malachite and rare azurite. This mineralisation is associated with stratiform and discordant copper-rich veins and local chalcopyrite enrichment within the pyrite belt, an elongated zone of weak stratiform sulphide mineralisation, or pyritiferous schist in the Upper Erins Quartzite Formation.

Based on the authors review of historical Government studies at Knapdale South and the 2014-2018 exploration work completed by Lorne Resources, the authors conclude that there are currently 4 primary areas of interest that include:

- Au-Ag-Cu orogenic quartz vein occurrences at Stronchullin (Stronchullin subproperty), Allt Dearg (Ormsary North sub-property) and Coire Odhar (Ormsary South sub-property); and
- Stratiform Cu-Co-Ag-Zn at Gossan Burn (Ormsary North).



A summary of the geochemical, geophysical and drill intercept highlights that characterize and support the delineation of the 4 prospects is detailed in Table 25.1. A QP site inspection was able to independently confirm Au-Ag and base metal analytical results at the Stronchullin prospect.

#### 25.3 Risks and Uncertainties

WGE (through Lorne Resources) controls sufficient ground and has sufficient Prospecting Agreements to access the project and continue future exploration programs. Details with respect to mineral tenure, permitting and environmental issues is provided in Sections 4.2 and 4.4 of this Technical Report.

As of the effective date of this report, the authors are not aware of any unusual risks or uncertainties, other than those that are inherent with all mineral exploration and development projects, that would limit Cassowary's right or ability to perform work on the Property.

## 26 Recommendations

The historical and Lorne Resources 2014-2018 geological and analytical exploration results presented in this Technical Report show that the Knapdale Au-Ag Project is a property of merit for the discovery of orogenic Au-Ag vein and stratiform massive sulphide Au-Ag-Cu-Zn deposits and requires further exploration. It is recommended that the Property be advanced through a Two-Phase exploration program:

- Phase 1 work program recommendations includes deep soil/overburden geochemical sampling surveys, ground geophysical orientation and target delineation survey(s) and a 14-hole diamond drill program at the Stronchullin prospect.
- Phase 2 work program recommendations includes additional deep-delineation and infill drilling at Stronchullin, and exploratory drilling at the Allt Dearg and Gossan Burn prospects.

The total cost of the recommended exploration work is estimated at CDN\$2.76 million; with a 10% contingency, the total cost estimate is CDN\$3.03 million (Table 26.1).

The cost of the Phase 1 and Phase 2 work programs are estimated at CDN \$796.000 and CDN\$1,958,500, respectively.

Phase 2 work is dependent on the positive results of the Phase 1 work.

A summary of Lorne Resources previous (2014-2018) exploration work that was completed at the Knapdale Property along with a summary of Phase 1 work recommendations as documented in the text below is presented in Figure 26.1.



## Table 25.1 Summary of prospective areas at the Knapdale Property based on historical Government studies and 2014-2018 exploration as completed by Lorne Resources.

Prospect	Sub-Property	Geochemical survey anomaly	Geophysical anomaly	Trench channel samples	Drilling intercepts
<b>Stronchullin</b> orogenic Au-Ag quartz veins Main lode 0.5-2.5 m width and 1.8 km possible strike length	Stronchullin	<ul> <li>15 km<sup>2</sup> Au-Ag-As-Bi-Cu-Pb-Sb panned concentrate anomaly (with up to 86 ppm Au + 16 ppm Ag)</li> <li>Mine dump samples up to 66 g/t Au + 18 g/t Au</li> <li>Float samples from Upper Gleann da Leirg up to 230 g/t Au and 181 g/t Ag; and 34.9 g/t Au and 249 g/t Ag</li> </ul>	ı No Survey Data	1.5 m at 25.2 g/t Au and 84.7 g/t Ag 0.5 m at 10.0 g/t Au and 10.4 g/t Ag 0.5 m at 27.8 g/t Au and 1280 g/t Ag with >1% As + >1% Sb	SD17-2: 1.05 m at 13.3 g/t Au, 32.0 g/t Ag, 0.29% As and 0.14% Sb SD17-3: 0.55 m at 41.8 g/t Au, 262 g/t Ag, 0.37% As and 0.26% Sb SD17-6: 3.55 m at 5.0 g/t Au and 2.81 g/t Ag includes 0.90 m at 9.50 g/t Au and 3.86 g/t Ag
<b>Allt Dearg</b> orogenic Au-Ag-Cu quartz veins Narrow, potentially high grade vein deposits	Ormsary North	<ul> <li>15 km<sup>2</sup> Au-Ag-As-Bi-Cu-Pb-Sb panned concentrate anomaly (with up to 57 ppm Au and 26 ppm Ag)</li> <li>Mine dump samples up to 3.20 g/t Au, 636 g/t Ag and 12.2% Cu</li> <li>Float samples up to 6.63 g/t Au, 13.3 g/t Ag and 0.68% Cu</li> </ul>	No Survey Data	Allt Dearg East, 1 m at 6 g/t Au, 1140 g/t Ag and 6.4% Cu Allt Dearg West, 0.5 m at 21 g/t Au, 61 g/t Ag and 5% Cu	Allt Dearg East Au-Ag-Cu vein is undrilled Allt Dearg West veins not intersected in hole OD17-5
<b>Coire Odhar</b> orogenic Au-Ag quartz veins	Ormsary South	15km <sup>2</sup> Au-Ag-As-Bi-Cu-Pb-Sb panned concentrate anomaly (with up to 16 ppm Au and 1.3 ppm Ag)	No Survey Data	No sampling undertaken to date	No drill targets identified to date
Gossan Burn stratabound Cu- Co-Ag Sulphide lenses wthin quartz- sericite-hematite schist Chalcocite enriched zone beneath leached hematitic cap	Ormsary South	Pyrite horizon with associated Cu-Zn drainage anomaly developed over 10 km strike length Gossan Burn panned concentrate: 776 ppm Cu, 2.1ppm Ag, 270ppm As and 109ppm Pb Float samples up to 40% Cu, 18.8 g/t Ag, 0.07% Co; and 27.7% Cu, 14.4 g/t Ag and 0.05% Co >1 km x 150 m soil Cu-Zn anomaly	>20 msec IP Chargeability anomaly in 1976 survey data	10 m at 5.10% Cu and 3.2 g/t Ag 2.5 m at 17.5% Cu, 0.07% Co and 9.6 g/t Ag 0.5 m at 10.7% Cu, 0.08% Co and 7.7 g/t Ag 2.5m at 1.75% Cu + 0.04% Co + 3.1 g/t Ag	No drilling to date



Table 26.1 Summary of exploration work recommendations to advance the Knapdale Property with preliminary cost estimates.

Phase	Prospect	Item	Description	Cost \$CDN	Cost £
	Multiple Deep till/soil Knapdale sampling program		A deep soil/overburden sampling survey over the interpreted 1,800 m strike-length of the Stronchullin vein system (approximately 350 samples) and to extend the Gossan Burn soil grid (approximately 250 samples)	\$66,000	£38,372.09
Phase 1	Multiple Knapdale prospects Geophysical ground surveys		Orientation and exploratory ground magnetic and HLEM geophysical surveys to test known occurrences and delineate new drill targets. Approximately 60 line-kilometres.	\$55,000	£31,976.74
	Stronchullin Diamond drill program (1st phase)		Fourteen drillholes totalling approximately 1,500 m. Exploratory and infill program to follow-up on the 2017- 2018 drill program.	\$675,000	£392,441.86
	Stronchullin	Diamond drill program (2nd phase)	Fifteen drillholes totalling approximately 3,000 m. Deep stratigraphy testing and infill drilling toward a potential resource estimation.	\$1,350,000	£784,883.72
se 2	Allt Dearg	Diamond drill program	Four exploratory drillholes totalling approximately 250 m.	\$112,500	£65,406.98
Phase 2	Gossan Burn	Diamond drill program	Six to eight exploratory drillholes totalling approximately 1,000 m.	\$450,000	£261,627.91
	Multiple Knapdale prospects	Technical Reports	Technical Reports that may include a Qualified Person site inspection, 3-D geological modelling a maiden inferred resource estimation(s).	\$46,000	£26,744.19
			Sub-total (Phase 1)	\$796,000	£462,790.70
			Sub-total (Phase 2)	\$1,958,500	£1,138,662.79
			Sub-total (Phase 1 and Phase 2)	\$2,754,500	£1,601,453.49
			Contingency (10%)	\$275,450	£160,145.35
			Total estimated exploration work cost	\$3,029,950	£1,761,598.84

Conversion rate is based on the one-year average of 1.72 Canadian Dollar equals 1 Pound Sterling



Figure 26.1 Summary of Lorne Resources previous (2014-2018) exploration work that was completed at the Knapdale Property along with a summary of Phase 1 work recommendations.





#### 26.1 Phase 1 Work Recommendations

#### 26.1.1 Deep Till/Soil Geochemical Sampling Program

Additional deep till/soil geochemical sampling grids are recommended to test the extent of the geochemical anomalies defined at the Stronchullin and Gossan Burn prospects. At Stronchullin, a new till/soil grid is intended to extend the present soil survey area along the interpreted 1,800 m strike length of the Stronchullin vein system. The survey will focus on the structurally favourable, sheared stratigraphic boundary between the Upper Erins Quartzite and Stronchullin Phyllite formations and is intended to increase confidence in the continuity of the vein system. At the Gossan Burn prospect, a new till/soil grid is intended to test the extent of a distinctive multi-element geochemical association that was documented in previous soil test work where basal peat bogs and surficial deposits overlie cupriferous sericite schist.

The survey grids should be designed within east-west (Stronchullin) and northwest (Gossan Burn) orientated, 100 m line-spaced survey lines. Samples should be collected along the lines at 20 m sample intervals with the sample interval reduced to 10 m in the surface-projected vicinity of known vein systems. Sample media will continue to be collected at the lowermost till point (i.e., directly above the till-bedrock contact). A percussion hammer drill will be used to drill the holes with basal till sample material being collected via a flow-through gold sampler attached to the rod string.

It is recommended that the geochemical programs collect approximately 350 and 250 deep till/soil samples at Stronchullin and Gossan Burn prospects, respectively (Figure 26.1). The samples should be analyzed by an independent and accredited third-party commercial laboratory for gold, base metal and trace elements.

Based on an all-in sampling and analytical cost of CDN\$110/sample, the cost of the Stronchullin and Gossan Burn deep till/soil geochemical sampling programs is estimated at CDN\$66,000.

#### 26.1.2 Ground Geophysical Survey

Regional Government and Grace Mission magnetic and gravity surveys show there are interesting and sharply contrasting features underlying the Knapdale Property (see Figures 6.12 and 6.13). To the best of the authors knowledge, the only detailed geophysical survey of the Knapdale Property area included 1970s surface magnetic and IP surveys as presented in Smith et al. (1978; see Figure 6.3). These BGS authors concluded that additional geophysical surveying is required to map out the extent of sulphide enrichment and to better delineate future drill targets.

Ground-based geophysical surveys are recommended to test and identify sulphide responses at the Knapdale Property. The purpose of the geophysical survey is to map sulphide associations, Fe-Mg-carbonate alteration, lithological contacts, and faults and/or shear zones, especially those with bends or culminations of anticlinal structures, high-angle reverse faults and/or cross-structures.



The exact survey instrumentation is not decided at this time but will include some component of a walking magnetic survey, a three-component slingram type EM system (HLEM) survey and/or an Induced Polarization (IP) survey. The uncertainty in geophysical method is related to the wind turbine farms and pipeline infrastructure at the Property. A series of 35KV buried powerlines underlie the Allt Dearg grid area and extend to the electric substation just northeast of Stronchullin mine. The 15 wind turbines also create EM fields. At Stronchullin, buried water pipelines and cables extend from the hydrodams at SD17-6 in Gleann da Leirg and the hydrodam on Stronchullin burn and extend along the DOB grid to the substation.

Consequently, the geophysical instrumentation will take some additional research and possibly ground orientation test work to delineate the exact ground geophysical methodology and survey area(s). Recommendations at this time focus on ground geophysical surveys at the Gossan Burn prospect area, which is furthest removed from the buried wind turbine cables and pipelines discussed in the text above (Figure 26.1).

An estimated grid of approximately 15-20 line-kilometres of ground geophysical surveying is recommended. The grid(s) should maintain a 50 m survey line spacing with the potential to infill at 25 m line spacing over anomalous responses. Recommended geophysical techniques – as of the Effective Date of this Technical Report – include:

- A walking mag survey operated in continuous survey mode with measurements taken every 1 second.
- An HLEM survey that involves multi-frequency readings taken at regularly spaced stations (i.e., between 10 and 25 m spacing) and incorporates a recommended 100 m transmitter-receiver coil separation to achieve penetration depths of approximately 50 m. A zone of wider HLEM separation should be tested for deeper penetration.
- An IP survey using either a conventional 2-D IP or a 3-D IP with readings being taken in a variety of configurations along and between lines to provide complete coverage of the survey area. At a minimum, the IP survey should utilize a poledipole array, with a dipole separation of 50 m and reading from n=1 to n=6 will should be capable of detecting chargeable sources at depths of up to 150 m.

The survey costing is based on 2- and 3-person work crews operating at a conservative 8 and 4 line-kilometres per day for the mag and HLEM surveys, respectively. The cost of the geophysical work at Knapdale is estimated at CDN\$55,000 and includes geophysicists, surveying, data processing and preparation of an internal report.

#### 26.1.3 Stronchullin Prospect Drill Program – 1<sup>st</sup> Phase

Additional diamond drilling is required to confirm the structural continuity and grade distribution of the main Stronchullin prospect. The subsurface information is required to



delineate potential high-grade ore domains and ultimately define a mineral resource that is compliant with CIM mineral resources and reserves definition standards (10 May 2014), CIM best practice guidelines (29 November 2019) and disclosure of technical information as per NI 43-101. The authors recommend a drill program intended to test along strike and down dip in known zones of Stronchullin mineralisation to better delineate these zones and potentially extend the overall size of the mineralised zone.

Fourteen diamond drillholes of 80-120 m depth are recommended for an approximate total of 1,500 m to further evaluate the resource potential of the Stronchullin quartz-gold lode structure (Figure 26.1). The drillholes will have various orientations with dips of approximately 50° to intersect the main Stronchullin quartz vein system, to test for sub-parallel quartz-gold hangingwall lode structures and to test the possibility of a blind sub-parallel lode structure developed within the Upper Erins Quartzite Formation.

The drill program has been designed in concert with the 2017-2018 drill program such that the combined drill programs will create a set of drillholes spaced 50 m apart. Results pending – this hole spacing is considered adequate by the authors to delineate higher grade ore domains within the Stronchullin vein system to a depth of 50 m and to confirm the presence of sub-parallel mineralised veins developed in the hanging wall and footwall of the main vein system. The drill results will enable development of a robust 3-D geological model capable of delineating various grade domains along with their structural controls on the high-grade ore domains. It is anticipated that 3-4 discrete high-grade domains, or zones, might exist within the currently defined 1,600 m strike length of the main Stronchullin vein system.

Using an all-in drill cost of CDN\$450 per metre, including drill management and technical supervision, geologists, overhead, consumables and drill core analytical work, the cost of the Phase 1 drill program at Stronchullin is estimated at CDN\$675,000.

The authors recommend that the entire cored length of the drillholes are assayed to help with any future mineral resource modelling and to test all strata for presently unknown instances of mineralisation. This recommendation is explicit as the analytical work by Lorne Resources in 2017-2018 assayed only mineralised zones and their direct host rock shoulders which would complicate block modelling. At this stage of Knapdale Au-Ag Project, it is recommended that the representative assay core samples are collected at intervals that do not extend beyond 2 m per sample (1.5 m preferred).

In addition to fire assay and ICP-MS analytical work, the authors recommend regular bulk density measurements are included in the analytical package for potential conversion of volumes to tonnage. Density measurements include mineralised and non-mineralised zones and all lithologies.

It is recommended that the QA-QC protocol include sample blanks and sample standards to at least 10% of the drill core samples. In addition, Cassowary should collect duplicate samples and/or analyze duplicate pulp samples at the primary. The latter is sufficient for an orogenic gold deposit due to the typical nuggety nature of the



mineralisation. It is also recommended that the duplicates be measured at a secondary laboratory – as part of the QA-QC stream.

The intent of these additional core sampling and assaying, and added QA-QC recommendations, is to advance the confidence level of the drill program, subsequent laboratory assay work, and to provide a sufficient dataset for any potential mineral resource modelling and estimation work.

#### 26.2 Phase 2 Work Recommendations

The Phase 2 work described in the following text is contingent on the positive results of the work completed in Phase 1.

#### 26.2.1 Drill Programs at Stronchullin, Allt Dearg and Gossan Burn

Phase 2 exploration work recommendations include extensive drill programs at the Stronchullin, Allt Dearg and Gossan Burn prospects. A total of approximately 27 drillholes are planned totalling about 4,250 m. The drill programs for the individual prospects are described briefly in the text that follows.

At Stronchullin, the second phase of drilling will be directed at the down plunge extension of the shallow ore domains as defined in Phase 1. This recommendation because of evidence of increasing quartz-sulphide stringer intensity and associated silica-sericite-pyrite alteration as documented toward the end of drillholes SD17-2 and SD17-6. The potential presence of blind, sub-parallel quartz veins hosted within Upper Erins Quartzite Formation should be tested at depth as part of any follow up drill program at the Stronchullin deposit.

This 2<sup>nd</sup> phase of drilling at Stronchullin is intended, therefore, to extend the length of some of the drillholes laterally into the hanging wall and footwall of the main Stronchullin lode structure. An additional 15 drillholes (beyond Phase 1 drilling) at depths of 150 to 300 m are recommended for a total Phase 2 Stronchullin drill program of approximately 3,000 m. Note: An application for a Scottish Environmental Protection Agency "Deep Borehole CAR License" will be required for drillholes >200 m vertical depth. Using an all-in drill cost of CDN\$450 per metre, the estimated cost of the Phase 2 Stronchullin drill program is CDN\$1,350,000.

With respect to the Allt Dearg prospect, the authors recommend a continuation of the initial 2017-2018 drilling as part of this Phase 2 diamond drilling programme. Four exploratory holes for an aggregate 240 m would allow Cassowary to complete the original program in which high-priority target areas were not accessible due to whether/topographic conditions. Using an all-in drill cost of CDN\$450 per metre, the estimated cost of the Phase 2 Allt Dearg drill program is CDN\$112,500.

A Gossan Burn prospect diamond drilling programme is dependent on generating encouraging results from the Phase 1 geochemical and geophysical surveys toward the



delineation of defined, cohesive anomalies coincident with mapped copper mineralisation. If this objective is met, a 6 to 8 drillhole program of relatively shallow diamond drilling is recommended to evaluate the copper potential at Gossan Burn. Using an all-in drill cost of CDN\$450 per metre, an approximately 1,000 m drill program at Gossan Burn is estimated to cost CDN\$450,000.

As outlined at the Phase 1 drilling text, the authors recommend that the entire cored length of the drillholes are assayed to help with any future mineral resource modelling and to test all strata for blind mineralisation. In addition to fire assay and ICP-MS analytical work, the authors recommend regular bulk density measurements are included in the analytical package for potential conversion of volumes to tonnage. Finally, it is recommended that the QA-QC protocol include sample blanks and sample standards to at least 10% of the drill core samples and duplicate samples, or pulp samples, should be analyzed at primary and secondary laboratories as part of the QA-QC core sample stream.

#### 26.2.2 Technical Reporting

Lastly, Phase 2 includes a Technical Reporting cost. As per the potential and scope of the Knapdale Au-Ag Project as illustrated in this geological introduction Technical Report and the recommendations included in the text above, an objective of the project is to prepare 3-D geological models and resource estimations. The modelling and estimation process include preparation, determination and interpretation of: data summary and histograms; drillhole database validation; quality assurance and quality control; lithological model/lode interpretation; assay summary statistics; drillhole flagging and composting; search ellipsoids; bulk density; block model extents; block model size; and model validation (visual, statistical, and easting, and northing and elevation comparisons). Any future resource estimation(s) will classify the mineral resource in accordance with guidelines established by the CIM Estimation of Mineral Resources and Mineral Reserves (2014).

Technical Reports will be compliant with NI 43-101 Standards of Disclosure for Mineral Projects, Form 43-101F1 Technical Report and related consequential amendments. The objective of the technical report is to provide a summary of material scientific and technical information concerning mineral exploration, development, and production activities on a mineral property that is material to an issuer. To the extent possible, the Technical Report will be simplified and understandable to a reasonable investor, however, the Technical Report will include sufficient context and cautionary language to allow a reasonable investor to understand the nature, importance, and limitations of the data, interpretations, and conclusions summarized in the technical report.

The cost of a maiden mineral resource estimate and Technical Report, which includes a 2020 QP site inspection, is estimated at CDN\$46,000.



## 27 References

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## 28 Certificate of Author

- I, D. Roy Eccles, P. Geol., do hereby certify that:
- 1. I am a Senior Consulting Geologist and the Chief Operations Officer of APEX Geoscience Ltd., #100, 11450 160<sup>th</sup> Street, Edmonton, Alberta, T5M 3Y7.
- 2. I graduated with a B.Sc. in Geology from the University of Manitoba in Winnipeg, Manitoba in 1986 and with a M.Sc. in Geology from the University of Alberta in Edmonton, Alberta in 2004.
- 3. I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta ("APEGA"; P. Geol.; Membership Number 74150) since 2003, and Newfoundland and Labrador Professional Engineers and Geoscientists ("PEGNL"; P. Geo.; Membership Number 08287) since 2015.
- 4. I have worked as a geologist for more than 30 years since my graduation from University. I have been involved in all aspects of mineral exploration, mineral research and mineral resource estimations for metallic, industrial and specialty mineral projects and deposits in Canada. Work experience includes gold and multiple commodity projects within Caledonide Orogen terranes.
- 5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- 6. I am responsible for overall preparation of the "*NI 43-101 Technical Report, Geological introduction to Knapdale Gold-Silver Project, Scotland*", with an effective date of 12 June 2020 (the "Technical Report"). I have not conducted a personal site inspection of the Knapdale Property.
- 7. To the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed, to make the Technical Report not misleading.
- 8. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 9. I am independent of the issuer, the vendor and the Property applying all of the tests in section 1.5 of both NI 43-101 and 43-101CP.
- 10. I have not had any prior involvement with the Property that is the subject of the Technical Report.
- 11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective date: 12 June 2020 Signing Date: 12 June 2020 Edmonton, Alberta, Canada



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



I, Douglas Turnbull, P. Geo., do hereby certify that:

- 1. I am a consulting geologist and President of Lakehead Geological Services Inc. at 300-1055 West Hastings Street, Vancouver, B.C. V6E 2E1.
- 2. I graduated with an Honours Bachelor of Science degree in Geology from Lakehead University in Thunder Bay, Ontario in 1988.
- 3. I am and have been registered as a Professional Geologist with the Engineers and Geoscientists of Professional Engineers and Geoscientists of British Columbia since 1992, License #19959.
- 4. I have worked as a geologist for more than 30 years since my graduation from University and have been involved in all aspects of exploration of orogenic, structurally controlled, vein hosted gold deposits.
- 5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- 6. I prepared Section 12.1 of the "NI 43-101 Technical Report, Geological introduction to Knapdale Gold-Silver Project, Scotland", with an effective date of 12 June 2020 (the "Technical Report"). I performed a site inspection of the Knapdale Property on February 5-7<sup>th</sup>, 2020 and can verify the Property, mineralisation and the infrastructure at the Knapdale Property.
- 7. To the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed, to make the Technical Report not misleading.
- 8. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 9. I am independent of the issuer, the vendor and the Property applying all of the tests in section 1.5 of both NI 43-101 and 43-101CP.
- 10. I have not had any prior involvement with the Property that is the subject of the Technical Report.
- 11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective date: 12 June 2020 Signing Date: 12 June 2020 Vancouver, British Columbia, Canada



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Douglas Turnbull, B.Sc. (Hons) P. Geo.

