

# Stavely Minerals Exploration Initiative

Ground within the Stavely Area previously held under a Section 7 (s7) exemption under the Minerals Resources (Sustainable Development) Act 1990 (MRSDA) will be available for application from **2 May 2022**.

## Geology of the Stavely Arc

Several belts of Cambrian volcanic rocks and related intrusives occur in western Victoria.

Similar rocks around the world occur in geological environments known as magmatic arcs, which can host economically important mineral deposits containing copper, other base metals and gold.

In western Victoria, these rocks have been collectively called the Stavely Arc.

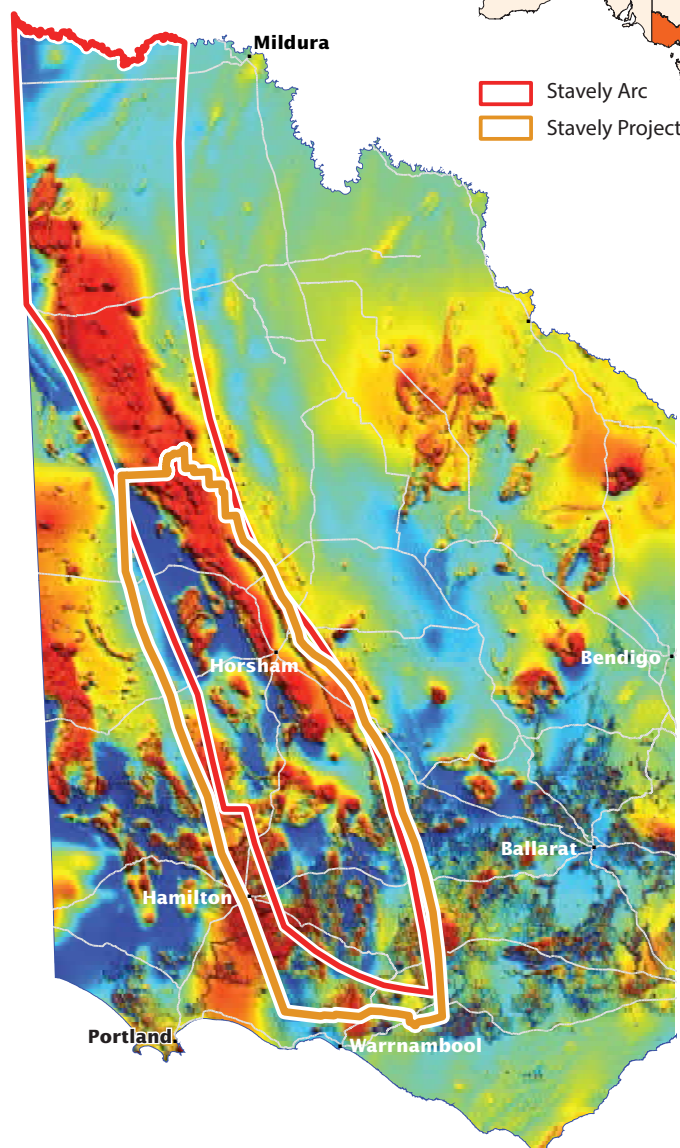
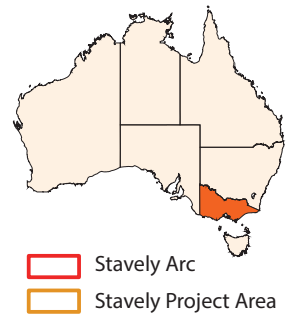
Rocks of the Stavely Arc are poorly exposed in several locations; the majority of the arc is hidden beneath a veneer of younger sedimentary rocks and other cover.

A number of known historical mineral prospects are associated with the exposed portions of the volcanic belts, several of which are being actively explored.

Although the rocks of the Stavely Arc have been studied where exposed, the potential of many of the covered belts remains untested.

Given the geological setting of the Stavely Arc and the known mineral potential, opportunity exists for new discoveries under cover.

An extensive geoscience program named the Stavely Project was completed as part of the Stavely Minerals Exploration Initiative. It involved stratigraphic drilling (holes **Stavely1-Stavely19**) and world-class research by the Geological Survey of Victoria (GSV), Geoscience Australia (GA) and other highly regarded research organisations including the Deep Exploration Technology Cooperative Research Centre.



The findings of this research have been publicly released in the form of technical geoscience data packages, reports<sup>1</sup> and a three-dimensional model of the regional geology<sup>2</sup>.

A 40 minute video, **Geoscience: The Stavely Arc – uncovering the geological evolution of western Victoria**, outlining the methodologies of this collaborative project has been published online<sup>3</sup>.

<sup>1</sup> <http://earthresources.efirst.com.au/categories.asp?cID=64>

<sup>2</sup> <http://earthresources.efirst.com.au/product.asp?plD=1159&cID=64&c=75212>

<sup>3</sup> <https://www.youtube.com/watch?v=yPf4UAK4k14>



## Southeast Stavelly Project Area

The area includes Early Palaeozoic age rocks of the Stawell Zone east of the Moyston Fault with proven potential to host large orogenic gold-related deposits (e.g. Stawell, Ararat), and significant magmatic-related gold and Volcanic Hosted Massive Sulphide (VHMS) (e.g. Mt Ararat) deposits. Stawell Zone rocks are concealed beneath younger cover rocks of the Murray Basin (northeast of Horsham), Newer Volcanics and Otway Basin (south of Ararat).

Minimal exploration drilling has been completed in this area and the gold and mineral potential of buried Stavelly Arc rocks within the 2022 Stavelly s7 area remains under-investigated.

Cover thickness on Stawell Zone rocks generally increases to the north and south of the region of Stawell Zone bedrock exposure (between Stawell and Ararat). Drillhole **Stavelly1** northeast of Mortlake intersected Stawell Zone rocks beneath 152 metres of Newer Volcanics and Otway Basin cover (*Schofield et al., Geoscience Australia Record 2015/030*)<sup>3</sup>.

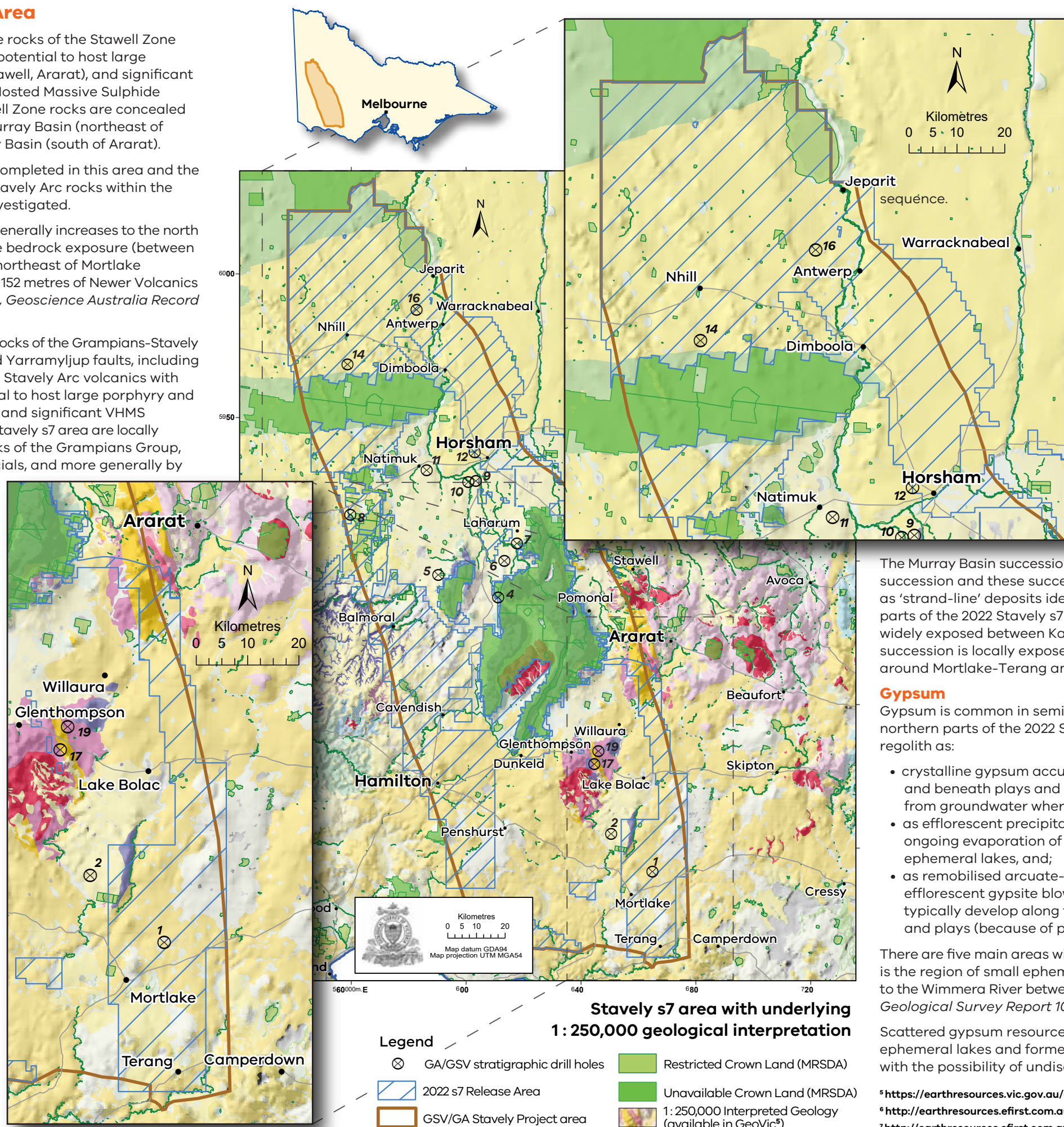
The area includes Early Palaeozoic age rocks of the Grampians-Stavelly Zone located between the Moyston and Yarramyijup faults, including many fault-slices of the Mid-Cambrian Stavelly Arc volcanics with proven and newly appreciated potential to host large porphyry and porphyry-derived Cu (Au, Mo) deposits and significant VHMS deposits. Stavelly Arc rocks in the 2022 Stavelly s7 area are locally concealed beneath younger cover rocks of the Grampians Group, Rocklands Volcanics and Permian glacials, and more generally by Murray Basin strata (north of Horsham and Telangatuk) and Otway Basin and Newer Volcanics strata (south of Lake Bolac and Cavendish).

Cover thickness on Stavelly Arc rocks generally increases to the north and south of the region of Early Palaeozoic bedrock exposure. Drillhole **Stavelly2** west of Woorndoo intersected Stavelly Arc rocks beneath 91 metres of Grampians Group cover rocks (*Schofield et al., Geoscience Australia Record 2015/030*)<sup>3</sup>. Drillhole **Stavelly16** southwest of Jeparit intersected Stavelly Arc rocks beneath 285 metres of Murray Basin cover.

Slices of NeoProterozoic serpentinised peridotite are fault-intercalated with Stavelly Arc rocks, with local potential for nickel (*Seymour, 2008; GSV Technical Record 2006/3*)<sup>4</sup>. Early Devonian-age magmatism within the Grampians-Stavelly Zone has proven magmatic-related gold potential (e.g. the historic Mafeking Goldfield), with many concealed Early Devonian magmatic centres interpreted throughout the s7 area underexplored or unexplored.

<sup>3</sup> <https://data.gov.au/dataset/ds-ga-21a3dca7-1ec1-cdec-e053-10a3070a4fe6/distribution/dist-ga-21a3dca7-1ec1-cdec-e053-10a3070a4fe6-8/details?q=>

<sup>4</sup> <http://earthresources.efirst.com.au/product.asp?pid=500&cld=37>



## Northern Stavelly Project Area

The area hosts Stavelly Arc rocks, which have been identified as prospective for copper and other base metals (e.g. zinc, lead) and Stawell Zone rocks, which have potential to host gold. Prospectivity is considered untested by drilling as these rocks occur under cover.

Gold exploration is active in the adjacent northern Stawell Zone. Critical mineral hosting mineral sands occurrences have been identified within the cover.

### Mineral Sands

The southern margin of the Murray Basin succession extends across the northern parts of the 2022 Stavelly s7 area and is known for mineral sands deposits, both fine-grained 'WIM-style' deposits including defined resources in the vicinity of Horsham and coarser-grained linear 'Strand Line' deposits including defined resources in the vicinity of Edenhope.

The 2022 Stavelly s7 area has seen extensive exploration for mineral sands over 30+ years (see *Olshina & van Kann, 2012; GSV Technical Record 2012/1*)<sup>6</sup>, with most areas outside known defined deposits shown to be sub-economic due to low mineral sands concentrations in the Loxton Sand (known as Parilla Sand) host unit, burial of Loxton Sand beneath excessive thicknesses of younger sand and clay cover, or both. Despite this, local opportunities to discover economic mineral sands resources within Loxton Sand in the 2022 Stavelly s7 area likely remain.

The Murray Basin succession transitions south into equivalent units in the Otway Basin succession and these successions also locally contain mineral sands resources such as 'strand-line' deposits identified between Edenhope and Casterton. In the southern parts of the 2022 Stavelly s7 area a veneer of Loxton Sand over Palaeozoic rocks is widely exposed between Kanagulk and Hamilton. The equivalent Brighton Group succession is locally exposed west of Dunkeld (Moutajup), east of Chatsworth and around Mortlake-Terang and remains under-assessed for mineral sands potential.

### Gypsum

Gypsum is common in semi-arid parts of northwest Victoria, including within the northern parts of the 2022 Stavelly s7 area. These deposits occur near-surface within regolith as:

- crystalline gypsum accumulations buried at shallow depths in topographic basins and beneath plays and clay pans formed over time by fractional crystallisation from groundwater where the water-table is shallow;
- as efflorescent precipitations (gypsite or 'copi') formed at surface from the ongoing evaporation of discharged groundwater in and adjacent to active ephemeral lakes, and;
- as remobilised arcuate-shaped aeolian deposits formed from reworked efflorescent gypsite blown by wind into concentrations within dunes that typically develop along the eastern shores of active and former ephemeral lakes and plays (because of prevailing westerly winds).

There are five main areas with historic gypsum production in Victoria, and one of these is the region of small ephemeral lakes and related fringing dunes (lunettes) adjacent to the Wimmera River between Dimboola and Lake Albacutya (*McHaffie & Buckley 1995; Geological Survey Report 102*)<sup>7</sup>, parts of which lie within the Stavelly s7 area.

Scattered gypsum resources (including former mines) occur in and adjacent to ephemeral lakes and former ephemeral lakes in the vicinity of Netherby and Yanac, with the possibility of undiscovered Gypsum prospectivity throughout this region.

<sup>5</sup> <https://earthresources.vic.gov.au/geology-exploration/maps-reports-data/geovic>

<sup>6</sup> <http://earthresources.efirst.com.au/product.asp?pid=1150&cld=64>

<sup>7</sup> <http://earthresources.efirst.com.au/product.asp?pid=519&cld=39>



## New opportunities

- New tectonic models developed for southeast Australia by the Geological Survey of Victoria offer different geological correlations to those previously suggested, and have unveiled new ideas for additional mineral exploration opportunities within Victoria.
- The Mount Stavely Volcanic Complex is already known to host a mineralised (Cu-Au) system at the Thursday's Gossan porphyry prospect and the Eclipse prospect of porphyry-VMS affinity. Over 1,160 kilometres of untested strike length is concealed under younger cover, which offers a new and largely untested area for mineral exploration.
- Applications for licences may be competing and it is advised that applicants familiarise themselves with Earth Resources Regulation's interim Competing Licence Applications policy prior to preparing their application.

## Victoria, Australia

- Victoria boasts political and economic stability and low sovereign risk.
- Victoria features easy access to sophisticated modern infrastructure, established markets and export pathways.
- Victoria provides opportunities for an enviable lifestyle in a secure environment with world class facilities and services.



## Victoria is committed to economic development

Victoria provides a positive business environment, continually improving regulation and security of tenure for mineral explorers and developers. A wealth of existing data for this region is available from the Earth Resources website. To access more Victorian minerals information, visit: [earthresources.vic.gov.au](http://earthresources.vic.gov.au).

## Victoria is committed to responsible mineral exploration and development

Victoria released **State of Discovery: Victorian Mineral Resources Strategy 2018-2023** in October 2018 and it is available for download from the Earth Resources website<sup>8</sup>. The strategy includes five key action areas:

1. *Confident communities and responsible explorers*
2. *Advancing geoscience and encouraging mineral exploration and development*
3. *Victoria as a global mining hub*
4. *Improve regulatory practice and industry compliance*
5. *Deliver modern fit-for-purpose laws*

## Victoria offers advice and information to assist explorers, including:

- A state-wide 3D geological model that can be used to analyse resource potential, predict the location of undiscovered earth resources and allow the development of four-dimensional geodynamic constraints<sup>9</sup>.
- An online tool to create customised GIS maps in real time or to view, download or interrogate geoscientific databases, including geology, drill holes, geochemistry and mineral occurrences<sup>10</sup>.
- Free digital geoscience maps, reports and data, including geological, geochemical, geophysical, regolith, minerals and open file tenement data are available through the online store<sup>9</sup>, and the GSV online catalogue<sup>11</sup>.
- Pre-competitive data, information and knowledge accumulated by the Geological Survey of Victoria from more than 160 years of mineral exploration and mining.



<sup>8</sup> <https://earthresources.vic.gov.au/geology-exploration/industry-investment/mineral-resources-strategy>

<sup>9</sup> <http://earthresources.efirst.com.au/>

<sup>10</sup> <http://www.earthresources.vic.gov.au/earth-resources/maps-reports-and-data/geovic/>

<sup>11</sup> [https://gsv.vic.gov.au/searchAssistant/reference.html?q=\\*:\\*](https://gsv.vic.gov.au/searchAssistant/reference.html?q=*:*)