Australian Vanadium Limited (“AVL”)  
High-grade vanadium supports DFS

**Key Investment Highlights**

- **Unique geological attributes of the Australian Vanadium Project** (“AVP” or “Project”), including a large high-grade vanadium resource within coarse grained high-grade massive magnetite ore, continuity and shallow oxidation of the ore deposit results in high mass recovery of vanadium to concentrate which differentiates the Project from existing global operations.

- **Robust economics at conservative long-term prices.** At AVL’s mid point PFS assumptions of US$13.00/lb years 1-5 and US$8.67/lb years 6-17 the AVP post-tax NPV₈% is US$280m with an IRR of 19.7%. With the V₂O₅ price at its three year average of US$11.74/lb and a current AUS:US$ rate of 0.67, our model generates a NPV₁₀% of A$763m and IRR of 35.1%.

- **Low risk upside potential exists to significantly extend mine life.** The AVP is open at depth and along strike. AVL has a total strike of 11.5km of known mineralisation and an initial ~3.5km open pit strike area. A JORC-compliant Inferred Resource of 75Mt is excluded from AVL’s initial 17 year mine plan, which would potentially add + 50 years of mine life with minimal capital outlay.

- **Near-term Project enhancement and PFS optimisation opportunities** include increased mine life, increased recovery rates in vanadium roast leach extraction, reduced start-up capital costs, earlier mining of transitional and fresh ore to reduce the strip ratio and lower operating costs.

- **Favourable Project location with supporting infrastructure in place.** AVL is advancing the permitting of the AVP with no major issues identified to date. The AVP is close to road, rail, natural gas, export ports and the region has a long history of over 100 years of mining operations.

- **Vanadium market poised to benefit from favourable fundamentals.** Limited supply of primary vanadium production coupled with increased demand for vanadium in the Chinese rebar steel market due to new standards in production and the emerging energy storage application uses should be positive for V₂O₅ prices in the long-term.

**Recent Company Updates**

- A high-grade vanadium-rich zone grading over 1% V₂O₅ has been identified consistently at depths below previous drilling in the planned open pit area, demonstrating that the high-grade resource is open at depth.

- These recent drilling results will be **included in a JORC-compliant resource upgrade planned for Q4 2019**, which will feed into the DFS mine plan.

- AVL has also recently conducted a **benchscale metallurgical testwork program** to optimise the process flowsheet for the AVP which is targeted at identifying improvements to the PFS economics and to support the finalised DFS design.

- Roasting at an optimised temperature and reagent conditions resulted in a **vanadium roast leach extraction of 95%, a substantial increase from 88%** without pelletising as applied in the PFS, resulting in upside to the DFS.
AVL is developing its 100% owned Australian Vanadium Project located in the Murchison region of Western Australia.

- AVL owns 100% of the Australian Vanadium Project, located in the Murchison region of WA.
- The Project is located approximately 43km south of the mining town of Meekatharra, 400km north-east of the Port of Geraldton and 750km north-east of Perth. The AVP consists of 11 tenements covering approximately 260km².
- The Project is a high-grade Vanadium Titanium Magnetite ("VTM") development asset with a completed PFS, which demonstrates the capacity for a substantial, long life and low operating cost mine.
- The AVP will produce high-purity (99.4%) V₂O₅ flake and powder product for the steel, chemical and battery markets. As outlined in the PFS, AVL will also produce cobalt, nickel and copper by-product.
- A DFS is underway on the AVP targeting completion with a view to optimising the PFS economics. A Mining Licence application has been lodged.

**Project Overview**

**Location of the AVP**

**Magnified Location of AVP**

**AVP Tenement Package**

**JORC Resources Table – High-grade Zone**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Classification</th>
<th>Mt</th>
<th>V₂O₅ %</th>
<th>Fe %</th>
<th>TiO₂ %</th>
<th>SiO₂ %</th>
<th>Al₂O₃ %</th>
<th>LOI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG 10</td>
<td>Measured</td>
<td>10.2</td>
<td>1.11</td>
<td>42.7</td>
<td>12.6</td>
<td>10.2</td>
<td>8.0</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Indicated</td>
<td>12.1</td>
<td>1.05</td>
<td>43.8</td>
<td>11.9</td>
<td>10.6</td>
<td>7.6</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Inferred</td>
<td>74.5</td>
<td>0.97</td>
<td>42.1</td>
<td>11.2</td>
<td>11.6</td>
<td>7.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td>96.8</td>
<td>1.00</td>
<td>42.4</td>
<td>11.4</td>
<td>11.3</td>
<td>7.7</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Source: 1. Fraser Institute Annual Survey of Mining Companies 2018, AVL.
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PFS Summary

- AVL completed a positive PFS on the AVP in December 2018 using Wood Mining and Metals consultants.
- The key highlights of the PFS are detailed below:
  - **Ore Reserve**: 18.24Mt at 1.04% V$_2$O$_5$;
  - **Concentrate production**: 900,000t pa of 1.40% V$_2$O$_5$ magnetite concentrate at an average yield of 60%;
  - **Production rate**: 22.5Mlb pa or 10,115t pa V$_2$O$_5$;
  - **Initial mine life**: 17 + years;
  - **Operating costs**: US$4.15/lb V$_2$O$_5$;
  - **Capital costs**: US$354m (including contingencies);
  - **NPV**: post-tax NPV$_{8\%}$ US$125m;
  - **IRR**: 12.4%;
  - **Pricing assumptions**: conservative pricing assumptions used are a flat US$8.67/lb for the life of mine.

Project upside

- We believe there are opportunities for AVL to deliver significant upside to the AVP projected returns as the project configuration is optimised over the course of the DFS process.
- Amongst these opportunities, the most significant are likely to be:
  1. **Reserve extension**: AVL will convert a significant proportion of its current Measured and Indicated Resource into Reserves through infill drilling for modest expenditure (circa A$1.0m) along strike from the current planned pit.
    - Converting 20Mt into Reserve would double mine life from the PFS to 28 years.
    - An additional benefit of extensional drilling is the potential to identify transitional and fresh material which is shallower than in the current pit design, enabling the delivery of lower oxide content blend to the processing plant earlier in the production schedule.
    - Including material with a shallower oxidation horizon would also reduce the overall strip ratio and potentially reduce the capitalised mining prestrip costs of approximately A$20m included in the PFS capex estimate.
  2. **Vanadium recovery and processing**:
    - Benchscale optimisation tests show a significant improvement in vanadium roast leach extraction. Vanadium yield in refining increased by 7% from the PFS reported rate to 95%, which would deliver overall recovery of vanadium from concentrate of circa 90%. As demonstrated in the sensitivity table overleaf, this recovery rate would materially improve project returns.
    - An alternative vanadium production route known as APV (ammonium polyvanadate) has been tested. The APV process would enable reduced reagent consumption and the potential to eliminate the desilication step required in the AMV (ammonium metavanadate) process.
    - AVL is also exploring new roasting technology to potentially reduce gas consumption by approximately 20%.
3. **Coproduct sales of calcine material**: there is potential to sell the calcine waste product from the refining process as a high Ti 54% iron ore product which could attract a price that would materially improve project economics.

4. **Staged production ramp-up**: A staged production scenario may also be viable for AVL to better manage the quantum of upfront capital required to achieve first production.

<table>
<thead>
<tr>
<th>NPV $’000</th>
<th>Refinery recovery</th>
<th>NPV $’000</th>
<th>Sale price - V2O5</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.3%</td>
<td>76.3%</td>
<td>80.4%</td>
<td>84.4%</td>
</tr>
<tr>
<td>(10.0%)</td>
<td>(5.0%)</td>
<td>0.0%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

| 1.33%       | 5.0%              | 1.37%      | 2.5%             | 1.43% |
| 1.44%       | 5.0%              | 1.47%      | 5.0%             | 1.50% |

**Key Sensitivities**

- Eden’s base case modelling assumes a conservative flat input price of US$8.67/lb for V₂O₅ product across the Project LOM and US$:AU$ 0.72.
- Long-term average prices for V₂O₅ 98% min China US$/lb suggest significant upside to this pricing assumption.
- With the V₂O₅ price at its three year average of US$11.74/lb and a current AU$:US$ rate of 0.67, our model generates NPV₁₀% of ~A$763m and IRR of 35.1%.

**Vanadium Cash Cost Curve**

- Primary producers of vanadium sit at the bottom quartile of the cost curve.
- The majority of production (72% in 2018) is as a coproduct to steel slag.
- There are only three primary vanadium mines operating outside of China.
- AVL is expected to be a bottom quartile cash cost producer.
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Vanadium Market Outlook

- AVL’s PFS opex of US$4.15/lb V₂O₅ is in the bottom quartile, with potential to be the world’s lowest cost vanadium producer
- Further opex reductions are possible through the Project optimisation areas AVL is currently evaluating for incorporation into the DFS
- Under Eden’s modelled optimised case we expect cash costs to be reduced significantly
- Vanadium prices are forecast to remain high by historical standards with prices at an average of ~US$18.0/lb
- Structural deficit forecast for the vanadium market
- AVL has several catalysts, in addition to a recovery in the V₂O₅ price, to promote a recovery in its share price

Vanadium Market Outlook

- The vanadium pentoxide price has declined from its peak in 2018, however prices are forecast to remain high by historical standards with prices at an average of ~US$18.0/lb.
- Robust and a growing demand from the steel sector coupled with significant upside from energy storage applications and constrained and limited supply is expected to lead to a sustained structural deficit in the vanadium market.

Next Steps

- Recent drill results will be included in a Resource upgrade planned for Q4 2019, which is likely to deliver a significant conversion of current Resource tonnes into Reserves.
- Program focused on development area in northern 2km of total 11.5km of AVL held deposit strike illustrating further near-term upside potential.
- Pilot scale metallurgical test program underway to confirm details of processing circuit for final DFS design.
- Hydrology drilling, DFS engineering and environmental approval support work is ongoing.
- Financing discussions and strategic agreements are progressing.

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