



Canola grown on paper mill bio- solids on tailing (Sudbury, Ontario)



## East Kemptville Tin-Indium Project: Profitable rehabilitation of a closed mine site

### Project Description

The 100% owned East Kemptville Tin-Indium Project is located 55km northeast of Yarmouth, Nova Scotia, Canada. The property consists of 4 exploration licences and a Special Licence covering over 10,000 acres in aggregate.

East Kemptville was an operating tin mine from 1985-1992 and was North America's only large primary tin producer, before closing prematurely in 1992 due to a collapse in tin prices after the international cartel was disbanded.

Increasing global demand for tin and tightening supplies have resulted in strengthening tin prices, creating an opportunity for Avalon to consider re-developing East Kemptville. Avalon is presently in the process of securing full tenure to the site under a mining lease to put the company in a position to re-start production at a small scale, utilizing the existing stockpile resources for initial feed to a gravity concentrator, supplemented by accessing near-surface higher grade tin resources. The present model provides for small scale re-development that will remediate the existing environmental liability and ultimately result in the full rehabilitation of the site.

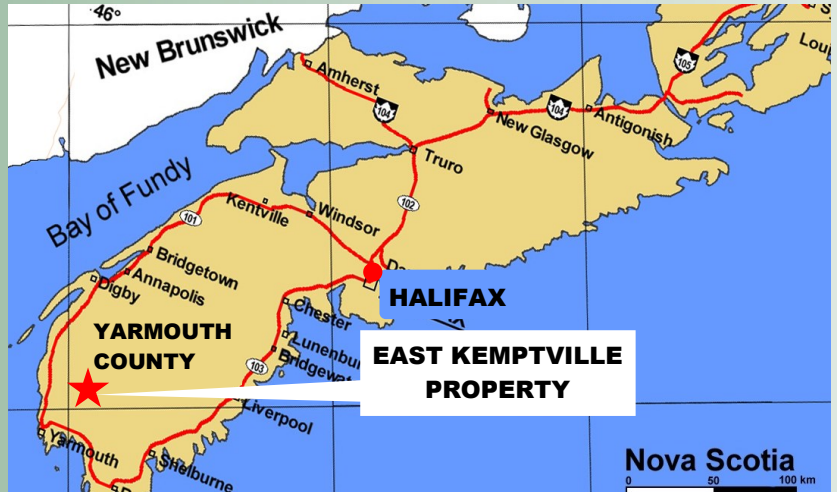
### A Sustainable Redevelopment Model

Avalon's redevelopment model involves initially processing the 5.87 million tonne stockpile of previously-mined oxidized low-grade mineralization, (a significant source of acid mine drainage), supplemented by selective mining of near-surface fresh higher-grade tin mineralization.

The freshly mined tin mineralization will serve an important purpose in the site rehabilitation concept by allowing for the generation of clean tailings free of sulphide minerals. These clean tailings will be used to create a cover for the existing dry-stacked tailings which, along with removal of the stockpiles, will fully remediate the long term environmental liability associated with the tailings and facilitate its ultimate conversion into other long term beneficial uses, such as a solar power generation or agriculture.

Avalon's small-scale, re-development model utilizes existing infrastructure and previously-mined material, making the project a low energy, low green-house gas producer that may also make the final product more attractive to Avalon's cleantech customers.

### Property Location



### Strategic Advantages

#### Infrastructure in place

- Accessible by paved highway
- Grid power on site
- Unused tailings management facilities

#### Deep water port

- Within 60 kilometres

#### Skilled labour available locally

- Within commuting distance to site

#### Politically-stable jurisdiction

- Supportive community and government
- No conflicting land uses

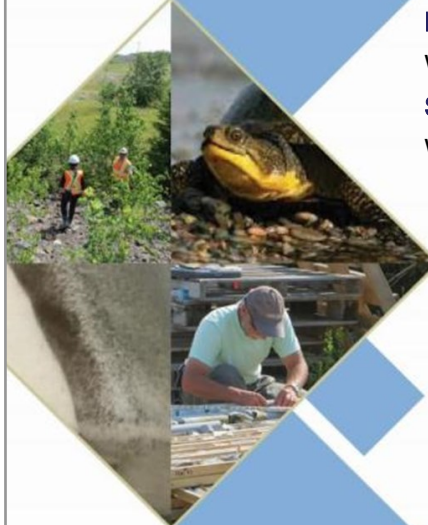
#### Large stockpiles on site

- In addition to in-the-ground resources

- Provide flexibility to future mine development

#### Potential for additional products

- Zinc, copper, indium and other rare metals



## PEA & Current Re-Development Model

Avalon's small-scale re-development model (utilized for the July 2018 PEA) contemplates a production schedule of approximately 1,300 tonnes per annum of a 55% tin concentrate for 19 years, with tin concentrates being sold to international markets. The redevelopment model primarily involves processing of the 5.87 million tonne stockpile of previously-mined oxidized low-grade mineralization grading 0.112% Sn, supplemented by the selective mining of 9.2Mt of near-surface fresh higher-grade tin mineralization from the Main and Baby Zone deposits.

The PEA concluded that tin concentrate production at East Kempville is economically viable at current tin prices in the range of US\$20,000 to US\$22,000/tonne. Assuming an average go-forward tin price of US\$21,038/tonne (as forecast by the World Bank Commodity Price outlook for 2020), and an exchange rate of CAD 1.30/USD, the project has an indicated pre-tax IRR of 15.0% and an NPV of C\$17.9 million at an 8% discount rate. The initial capital cost is estimated at just C\$31.5 million. Average annual revenues from sales are calculated as C\$17.75 million vs. annual production costs of C\$11.6 million. With this model, Avalon has the advantage of re-starting production at a small scale and low CAPEX, with potential to scale up production in the future and recover additional by-products such as indium.

Next steps include optimizing the metallurgical process flowsheet, arranging project financing and off-take agreements and initiating plant design and procurement activities.



**AVALON**  
ADVANCED MATERIALS INC.

130 Adelaide Street West, Suite 1901  
Toronto, ON Canada M5H 3P5  
T: (416) 364-4938  
E: IR@AvalonAM.com

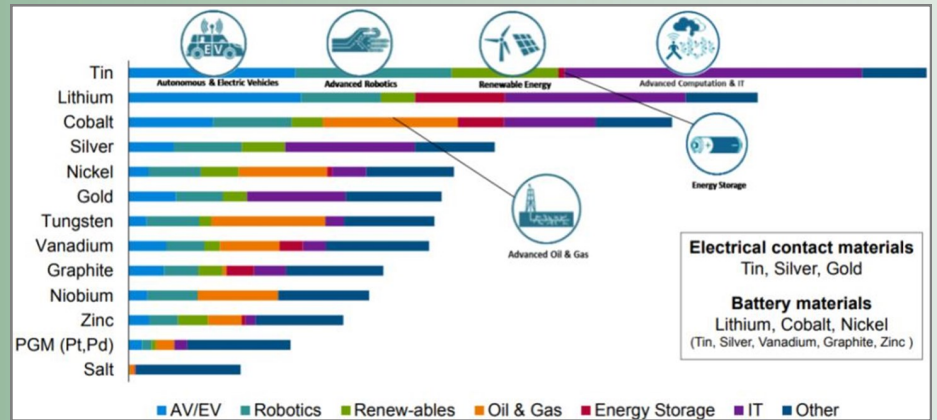
www.AvalonAM.com

## Tin Markets

Rising tin prices over the past 10 years reflect growing global demand for tin due to its increased application in electronics, where it is used in solders as a non-toxic alternative to lead, and in energy storage and renewable energy applications such as solar panels. In fact, tin is now increasingly recognized as a "technology metal" and was recently ranked in a study conducted at MIT for Rio Tinto as the number one metal most impacted by new technology.

## Metals Most Impacted by New Technology:

**Tin is No. 1!** Source: MIT / Rio Tinto, March 2018



Production of tin concentrates from traditional sources in southeast Asia has declined in recent years, increasing the need for new primary supply sources, such as East Kempville, to emerge.

Over the next five years, the International Tin Association (ITA) sees modest growth in demand and stable to rising prices due to continuing supply shortages of tin recovered from conflict-free sources.

## LME Tin Prices (USD/Tonne)



The technical information contained in this document, unless otherwise noted, has been reviewed and approved by Don Bubar P.Ge. (ON), President & CEO of Avalon, the qualified person for the purposes of National Instrument 43-101.

**FORWARD LOOKING INFORMATION:** This document contains or incorporates by reference "forward looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities legislation, which may not be based on historical fact. Readers can identify many of these statements by looking for words such as "believe", "expect", "will", "intends", "projects", "anticipates", "estimates", "continues" or similar words or the negative thereof. Statements that are not based on historical fact contained in this presentation, including through documents incorporated by reference herein, are forward-looking statements that involve risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in the forward-looking statements. Such forward-looking statements reflect the Company's current views with respect to future events and include, among other things, statements regarding targets, estimates and/or assumptions in respect of reserves and/or resources, and are based on estimates and/or assumptions related to future economic, market and other conditions that, while considered reasonable by the Corporation, are inherently subject to risks and uncertainties, including significant business, economic, competitive, political and social uncertainties and contingencies. These estimates and/or assumptions include, but are not limited to: grade of ore; tin and by-product commodity prices; metallurgical recoveries; operating costs; achievement of current timetables for development; strength of the global economy; availability of additional capital; and availability of supplies, equipment and labour. Factors that could cause the Company's actual results, performance, achievements, developments or events to differ materially from those expressed or

implied by forward-looking statements include, among others, but are not limited to, market conditions, the possibility of cost overruns or unanticipated costs and expenses, the impact of proposed optimizations at the Company's projects, actual results of exploration activities, mineral reserves and mineral resources and metallurgical recoveries, discrepancies between actual and estimated production rate, mining operational and development risks and delays, regulatory restrictions (including environmental), activities by governmental authorities, financing delays, joint venture or strategic alliances risks, or other risks in the mining industry, as well as those risk factors discussed or referred to in the Company's annual Management's Discussion and Analysis and Annual Report filed with the securities regulatory authorities in all provinces and territories of Canada, other than Québec, and available at www.sedar.com. Most of the foregoing factors are beyond Avalon's ability to control or predict. Although the Company has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that the plans, intentions or expectations upon which these forward-looking statements are based will occur. The forward-looking statements contained herein are qualified in their entirety by this cautionary statement. Readers should not place undue reliance on the forward-looking statements, which reflect management's plans, estimates, projections and views only as of the date hereof. The forward looking statements contained herein is presented for the purpose of assisting readers in understanding the Corporation's expected financial and operating performance, and the Company's plans and objectives, and may not be appropriate for other purposes. Avalon does not undertake to update any forward-looking statements that are contained herein, except in accordance with applicable securities law.