Mid to Late Devonian Volcanism and Zinc Mineralization at Boundary Zone: Upside from Ore Sorting at a New Zone for the MacMillan Pass Project

Jack Milton - November 2019
Thank you!

Ross River Dena Council
Kaska First Nations
Liard First Nation
First Nation of Na-cho Nyäk Dun
The following statements are required by Canadian securities legislation:

PEA Cautionary Note:

Readers are cautioned that the PEA is preliminary in nature, it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA results will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability. Additional work is needed to upgrade these mineral resources to mineral reserves.

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NI43-101 Qualified Person:

Brandon Macdonald P.Geo, CEO and Director of Fireweed Zinc, and a Qualified Person under the meaning of Canadian National Instrument 43-101, is responsible for the technical information in this presentation. Leon McGarry, P.Geo., Senior Resource Geologist for CSA Global Canada Geosciences Ltd. is independent of Fireweed Zinc Ltd. and a ‘Qualified Person’ as defined under Canadian National Instrument 43-101. Mr. McGarry is responsible for the Mineral Resource Estimate and directly related information in this presentation. Michael Makarenko, P.Eng., Project Manager for JDS Energy and Mining, Inc., is independent of Fireweed Zinc Ltd. and a ‘Qualified Person’ as defined under Canadian National Instrument 43-101. Mr. Makarenko is responsible for the PEA results and directly related information in this presentation.
## Massive Resource

### About Macmillan Pass

The Macmillan Pass Project is located in the Yukon region of Canada, near Whitehorse and Ross River.

### 2018 Resource Update

<table>
<thead>
<tr>
<th>Type</th>
<th>Tonnes</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Ag g/t</th>
<th>ZnEq %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated Total</td>
<td>11,207,000</td>
<td>6.59</td>
<td>2.48</td>
<td>21.33</td>
<td>9.61</td>
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<tr>
<td>Inferred Total</td>
<td>39,465,000</td>
<td>5.84</td>
<td>3.14</td>
<td>38.15</td>
<td>10.00</td>
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</table>

### Contained Metal

<table>
<thead>
<tr>
<th>Metal</th>
<th>Zn Mt</th>
<th>Pb Mt</th>
<th>Ag MOz</th>
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<tbody>
<tr>
<td>Zn</td>
<td>0.74</td>
<td>0.28</td>
<td>7.69</td>
</tr>
<tr>
<td>Pb</td>
<td>2.23</td>
<td>1.22</td>
<td>48.41</td>
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</table>
Among the Biggest with >4 Mt Metal
Over 540 km² Open for Discovery

- **Tom** and **Jason** Deposits
- **Tom North** drilled in 2019

*End Zone* 2018 drilling included 4.78% Zinc, 10.17% Lead, 87 g/t Silver over 11.08 m
Boundary Zone – Giant Potential

- 2019 Drilling
  - NB19-002:
    - 230 m of 4.14% Zn from surface
    - Including 100 m of 7.95% Zn
  - NB19-001:
    - 230 m of 3.44% Zn from surface
    - Including 97 m of 5.63% Zn
Boundary Zone – Giant Potential
Boundary Zone – Giant Potential

- Clearly defined central zone shows consistency
- Several holes >200 m of 2.5% Zn
- Central Area is at minimum 400 m x 250 m with a thickness of 250 m
Boundary Zone – Ore Sorting

- Mineralization very different from Tom & Jason
  - sphalerite-siderite-pyrite and minor galena in veins, stockworks, interstitial disseminations;
  - and as replacement of matrix and clasts within coarse clastic rocks
- Preliminary Ore-Sorting Test Very Encouraging
  - Potential to upgrade the feed grade from 2.5% Zn to >5% Zn at a low cost
  - Rejection rate expected between 70-50%, with zinc recoveries from 80% to 85%
  - Mass pull ranged from 30% to 50%
Boundary Zone – Ore Sorting

- Heterogeneous grade distribution
- Potential for selective mining from an open pit
- Ore sorting pre-concentration
- Campaign through Tom mill, or blend with Tom-Jason mill-feed
- Significant potential to change the face of the project
Boundary Zone – Geological setting

- Fuller Lake Member: Frasnian to early middle Famennian
- Tom (Zn-Pb-Ag-barite)
- Jason (?) (Zn-Pb-Ag-barite)
- Boundary Zone

Earn Group (Mid-late Devonian)
- MacMillan Pass Member
- Niddery Lake Fm.
- Barite
- Sapper Fm.

Road River Gp. (Ord- early Devonian)
- Fuller Lake Member
Boundary Zone – Geology

- Hosted adjacent to major synsedimentary fault system
- Rapid lateral thickness changes in volcaniclastic rocks, conglomerates and diamictites
- Diamictites indicate slumping off active fault scarps
- Large hydrothermal system centered around the center of the basin
Boundary Zone – Volcaniclastics

- Alkalic mafic to intermediate volcaniclastic rocks: fragmental lapillistone to tuff to lapilli breccia
- Vesicular, scoriaceous, fragmental eruptive fallout and surge deposits
- Few flows, mostly volcaniclastic rocks
- Gabbro intrusions underlie the volcaniclastic rocks
- Matrix is composed of calcite-dolomite

Geological setting

Boundary Zone – Volcaniclastics

(From Leybourne et al., 2018)
Boundary Zone – Volcaniclastics

Geological setting

[Image: Geological setting diagram from Leybourne et al., 2018]
Boundary Zone – Mineralization styles

- Replacement of clasts and matrix in coarse clastic rocks
Boundary Zone – Mineralization styles

- Veining, and stockwork veins of sphalerite-galena-pyrite
Boundary Zone – Mineralization styles

- Vein-breccias
- Permeability controlled veining
Boundary Zone – Mineralization styles

- Banded veins Sphalerite-Galena-Pyrite-Siderite
Boundary Zone – Mineralization styles

- Massive to semi-massive sphalerite, sphalerite-pyrite
- Grades up to 62% Zn
Boundary Zone – Alteration styles

- Calcite/Dolomite to Siderite
- Pyrite
- Extensive siderite alteration causes gravity high
- Silicification of volcaniclastic rocks and conglomerates
Boundary Zone Geochemistry

- Association of Zn-Pb-Ag-Ge-Ga-Tl-Cd-Mn-Fe-Hg-As-(Sb-Cu)
- Low Se-Mo-U-Ba
- Highly variable grade
- Germanium associated with sphalerite
Boundary Zone Structure

- Early, syn-sedimentary faults; some veins parallel the fault and high-grade occurs near the fault
- Reactivated later as a reverse fault
- Beside Hess fault or splay of fault, linking it to End Zone and Jason
- Foliation cross-cuts the veins, constraining the timing to pre-deformation
Boundary Zone - Genesis

- Early, syn-sedimentary faults
- Similar fluids to Tom and Jason
- Permeability controlled fluid flow
- Fluid overpressuring and hydrofracturing
- Reactivity with carbonate-rich volcanioclastic rocks
- Replacement of carbonate
- Feeder-type mineralization
Boundary Zone – What was it feeding?

- Feeder-type mineralization identified
- Barite known from the area
- Potentially the roots of a very large system that may contain barite hosted massive sulphide
Boundary Zone – Ripe for exploration

- No comprehensive geophysics
  - Gravity responds well to siderite-sphalerite
  - Magnetics track volcanic rocks
  - EM tracks stratigraphy
- Open in all directions
- Large Zn and Pb anomalies in soils
- Under-explored
- Significant exploration planned for 2020
Boundary Zone – Next steps

- Review of drilling data to support Mineral Resource Estimate
- Bulk-scale 2000 kg ore sorting testwork (particle sorting)
- Airborne VTEM-magnetics
- Ground gravity
- Soil geochemistry
- 2020 drill program
- Integrate Boundary Zone into the Macmillan Pass project, to be developed alongside the Tom and Jason deposits
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