

# Fireweed Announces Positive Metallurgy from Boundary Zone, Macmillan Pass

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VANCOUVER, Nov. 01, 2022 - [Fireweed Metals Corp.](#) ("Fireweed" or the "Company") (TSXV: FWZ; OTCQB: FWEDF, formerly known as Fireweed Zinc Ltd.) is pleased to announce the results of the first metallurgical and ore-sorting test work from Boundary Zone, an emerging zinc discovery at Macmillan Pass, Yukon, Canada.

## Highlights

- Open circuit cleaner flotation tests show up to 97% zinc recovery.
- Zinc concentrates show high grades ranging from 53% to 63% zinc.
- A coarse grind size yields excellent recovery, with up to 99% in rougher tests.
- Three critical minerals are present in concentrates: zinc, germanium, and gallium.
- Selective use of ore sorting only on low-grade material shows promising results for potentially increasing feed grades, decreasing processing costs, and reducing tailings volumes whilst preserving the value in the abundant high-grade zones at Boundary.

## *CEO Statement*

Brandon Macdonald, CEO, stated "The first metallurgical results from Boundary Main are back and show excellent results. The coarse nature of the sphalerite means that a relatively coarse grind size is all that is needed to produce a high-grade zinc concentrate with high recoveries. We have shown that Boundary Zone, like Tom and Jason, can produce high-quality zinc concentrates that we anticipate would be attractive to global markets. High concentrations of germanium and moderate concentrations of gallium in the zinc concentrates highlight the potential for recovery of these critical metals as by-products during the zinc smelting process. Even though we see by far the most potential economic value in the zinc, the addition of germanium and gallium to the mix brings the total of different critical metals present at Boundary Zone to three. This elevates the potential of the Macmillan Pass project to be one of Canada's leading critical minerals projects."

## Plain Language Summary

Preliminary test work has been carried out on samples from Fireweed's new zinc discovery at Boundary Zone at the Macmillan Pass project, Yukon. These tests provide an initial impression of how the zinc- and lead-bearing rocks may respond to crushing, grinding, and processing to produce zinc and lead concentrates.

The test results are very promising: the rocks have a moderate to moderately high hardness; a reasonably coarse grind size is sufficient to liberate zinc and lead minerals; and high-grade zinc concentrates can be produced from most of the material tested from Boundary Zone with only small amounts of zinc loss during processing.

Lead is only a minor component of the mineralization at Boundary Zone and only samples with appreciable amounts of lead were metallurgically tested with a dedicated lead circuit. Lead test work results were variable and generally poorer than for zinc. With the relatively low lead content of Boundary Zone shown to date, this likely limits the overall economic importance of lead.

Likewise, there is limited silver in much of Boundary Zone Main, and the samples showed low silver grades. This metallurgical testing showed variable results for the limited silver in the material tested, however silver has never been of material economic importance in this zone.

Ore sorting is a process where mined material is scanned for various properties, including density and metal concentration, and then sorted to remove waste before milling. The test work results showed that the low-grade material that surrounds the higher grade zones at Boundary Main has properties which make it suitable for ore sorting, and there exists an exciting possibility of deploying this technology to reduce costs and improve economics at the project. Higher grade zones would likely not be sorted to prevent any losses of the higher-value material during the sorting process.

The test work is preliminary in nature, and further testing is required to more accurately predict the behaviour of Boundary Zone material during processing. However, the results suggest metallurgical performance for zinc could be excellent and should not be an impediment in demonstrating reasonable prospects for eventual economic extraction.

#### Description of Metallurgical Test Work

Approximately 2.6 tonnes of drill core from Boundary Zone were analyzed by Base Metallurgical Laboratories of Kamloops, BC for ore characterization, preliminary flotation optimization, variability testing, and ore sorting test work. Two parallel streams of test work were conducted: one conventional flotation stream, and a stream with an ore sorting pre-concentration step.

Representative drill core from Boundary Zone was quartered, with one set of quarter-core samples used for the conventional flotation test work stream without sorting, and the other parallel set of quarter-core samples used for ore sorting tests prior to flotation test work. A total of nine composites were made to represent the range of lithologies and mineralization styles found at Boundary Zone; two were waste rock domains and not subjected to metallurgical testing.

Flotation test work involved the production of a zinc concentrate in an open circuit batch test. Two of the seven mineralized composites had significant lead head grades and included a lead circuit to produce a lead concentrate prior to zinc flotation. Rougher tests were performed, followed by open circuit cleaner flotation tests.

Preliminary ore sorting test work was carried out to demonstrate the potential to use sensor-based particle sorting as a pre-concentration step to increase feed grades for the lower grade material at Boundary Zone. A sequential combination of X-Ray Transmission (XRT) and X-Ray Fluorescence (XRF) sensors was tested.

#### Composite Selection and Boundary Zone Geology

The nine composites described in Table 1 below were created from NB19-001 and NB19-002, two holes drilled at Boundary during the 2019 field season (Map 1), representing the mineralization styles and waste rock present at Boundary Main. The five composites selected for cleaner flotation tests are shown on Cross Section A-A' with preliminary geometallurgical domains that have been interpreted based on rocks of similar lithology and mineralogy.

Table 1: Description of sample composites, head grades, and flotation tests conducted.

Composite	Description
Volcanic 1	
Clastic 2	Typical material present from surface to vertical depths of 200-250 m, comprising bulk of zinc mineralization interpreted present at Boundary Main
High Grade 3	
Clastic 5	Pyrite-rich material sampled in footwall of a significant fault at Boundary Main; small domain above Volcanic 1
Clastic 6	Low grade
Volcanic 7	Small domains that occur at depth at Boundary Main
Mudstone 8	

Waste 4	Waste. Not used
Waste 9	Waste. Not used

Further test work is required to fully evaluate the variability across Boundary Zone and assess whether the metallurgical behaviour throughout each domain is consistent.

The massive sulphide mineralization at Boundary West was discovered after samples were selected for this first round of metallurgy testing and is not represented by composites disclosed in this news release (for details of Boundary West mineralization see Fireweed news releases dated February 3<sup>rd</sup> 2021, and September 16<sup>th</sup> 2021). Flotation test work is currently underway on a composite of that new domain. The laminated stratiform mineralization at Boundary West (see Fireweed news release September 16<sup>th</sup> 2021) and at Boundary Main (see Fireweed news release September 13<sup>th</sup> 2022) was also discovered after initial metallurgy sample selection so is not represented in this news release, but is anticipated to have a similar metallurgical response to the texturally and mineralogically comparable styles of mineralization previously tested at the Tom and Jason deposits (see Fireweed news release dated May 15<sup>th</sup> 2018) and will be the subject of future metallurgical testwork.

#### Rougher Flotation Tests

All rougher tests were conducted using a primary grind size of 75 µm K<sub>80</sub> except for composite High Grade 3, which used a coarser grind of 95 µm K<sub>80</sub>. Recovery of zinc was very good, with recoveries of 94-99% for the Volcanic 1, Clastic 2, High Grade 3 and Clastic 5 composites that represent the bulk of the near-surface mineralized material at Boundary Main (Cross Section A-A'). These composites yielded zinc rougher concentrates that ranged from 14.5% Zn to 44.6% Zn, reflecting a wide range of head grades of 1.39% Zn to 16.7% Zn. Slightly lower recoveries of 78-88% were produced from the Clastic 6, Volcanic 7 and Mudstone 8 composites (Table 2).

The material tested from Boundary Main was generally lead-poor, unlike the stratiform, laminated mineralization that occurs at Tom, Jason and other parts of Boundary Zone. Only two composites were tested with a lead circuit prior to the zinc circuit. Clastic 5 had poor performance with 10.9% rougher recovery at 1.7% Pb due to low head grades (0.64% Pb) and high pyrite content. Volcanic 7 had better results with rougher recovery of 77.5% at 7.75% Pb due in part to higher head grade (1.87% Pb).

#### Open Circuit Cleaner Flotation Testing

Regrinding of rougher concentrates was carried out to a sizing of K<sub>80</sub> 13 to 36 µm for the zinc circuit and 12-21 µm for the lead circuit, where tested. Open circuit zinc cleaner tests were conducted on six samples that yielded zinc recovery between 68 and 97 percent at concentrate grades between 53 and 63 percent zinc (Table 3). Similar to rougher tests, the near-surface geometallurgical domains Volcanic 1, Clastic 2, High Grade 3, and Clastic 5 that represent the bulk of the mineralization at Boundary Main produced better results, with zinc recovery of 83.3 to 97.1 percent, showing higher recovery at higher feed grades.

Zinc cleaner concentrate grades are above grades typically required for marketable zinc concentrates. Silver is present in the zinc concentrate at levels below the typical threshold to be payable. The concentrate is anticipated to be saleable, although it will attract a modest penalty due to the moderate mercury concentrations (Table 4). Mercury penalties could potentially be reduced by blending with lower mercury content concentrate, such as the 155 ppm mercury in zinc concentrate produced from the global composite tested from the Tom and Jason deposits (see Fireweed news release dated May 15<sup>th</sup>, 2018). Mercury concentrations are lower in the near surface Volcanic 1, Clastic 2 and High Grade 3 domains than the smaller geometallurgical domains present at greater depths. Iron is present in desirably low concentrations (2.35-6.39%). The critical metals germanium and gallium are present in concentrations that are potentially recoverable by zinc smelters with appropriate recovery circuits.

Two composites had head grades high enough to warrant consideration of a lead circuit and test work yielded mixed results, with silver generally reporting to the lead concentrate. Only a limited amount of optimization was carried out to attempt to improve recovery as lead and silver comprise only a small portion of the mineralization discovered to date at Boundary Main and much of the mineralization is zinc-only. Fireweed anticipates that running a zinc-only flotation circuit for low lead-silver material in any future potential Boundary Zone development plans has the potential to reduce processing costs compared to running both

lead and zinc circuits. If Boundary Zone were to be co-developed with the Tom and Jason deposits, Fireweed anticipates that a lead circuit would be implemented before the zinc circuit to recover lead and silver from zones at Tom, Jason and Boundary where high lead and silver grades occur.

### Ore Sorting Results

Ore sorting test work was performed by Steinert (Germany), and resultant assays and analyses were performed by Base Metallurgical Laboratories (Kamloops, BC). XRT sorts material by density whereas XRF sorts by geochemistry; XRF was included due to the presence of dense siderite (iron carbonate) which cannot be distinguished from dense sulphide minerals in XRT testing alone. A combination of XRT and XRF yielded the best zinc recovery (87-99%) but at a high mass pull (42-90%). Sorting by XRF only showed promising results, particularly for lower grade material where lower recovery may be deemed more acceptable, with zinc recovery of 75-88 percent at mass pulls of 36 to 52 percent (Table 5).

The high-grade composite was not included in ore-sorting tests, as such material is prone to risk of excessive metal loss from sorting, assuming the material is selectively mined. Ore sorting has the potential to add value to the project by potentially reducing processing costs, increasing feed grades by pre-concentration, and reducing tailings volumes. Although Fireweed sees the potential for a successful project without the need for ore sorting, Fireweed anticipates that the pre-concentration of only the low-grade material by ore sorting has the greatest potential to add additional value to the project. Ore sorting on the lower grade composites achieved the highest mass rejection, resulting in the greatest upgrade ratio of the feed material. This upgrading shows the potential for the extraction of the critical mineral zinc from stockpiles of material that may normally be considered as waste, mined coincidentally whilst extracting higher-grade material, potentially increasing value and lowering environmental impacts. Fireweed cautions that the ore sorting test results are preliminary in nature, and may or may not be included in future processing plans at Boundary Zone.

### Comminution

Comminution test work determined the grinding energy required to liberate zinc and lead minerals prior to flotation, and abrasion testing to determine mill and grinding media wear characteristics:

- Bond ball mill work index (BWi) tests at a sieve size of 106  $\mu\text{m}$  showed the material to be moderate to moderately hard with BWi values ranging from 13.2 to 18.3 kWh/t.
- SAG mill comminution testing derived A\*b values between 39 to 52, which classifies the composites as average with respect to hardness.

### Mineralogy

A QEMSCAN Bulk Mineral Analysis (BMA) and quantitative X-Ray Diffraction (XRD) were conducted to determine the mineralogical composition of the seven composites. Mineralogical composition was used to estimate the concentrations of reagents to optimize flotation. Up to 26.8% sphalerite and up to 2.5% galena was present in the composites, confirming the un-oxidized, sulphide nature of the mineralization.

Notes on sampling, assaying, and data aggregation: The diamond drill core logging and sampling program was carried out under a rigorous quality assurance / quality control program using industry best practices. Drill intersections in this release are all HQ3 (split tube) size core (61.1mm / 2.4-inch diameter) with recoveries typically above 85%. After drilling, core was logged for geology, structure, and geotechnical characteristics, then marked for sampling and photographed on site. The cores for analyses were marked for sampling based on geological intervals with individual samples 1.5 m or less in length. Drill core was cut lengthwise in half with a core saw and each half cut again to produce four parallel quarter-core samples; one quarter was sent for assay (previously reported in Fireweed news releases dated October 16<sup>th</sup> 2019 and November 5<sup>th</sup> 2019), one quarter stored on site for reference, one quarter used for ore sorting tests, and one quarter used for flotation test work with no ore-sorting. In September 2019, samples were transported to Base Metallurgical Laboratories, Kamloops, BC, by truck and stored there until test work was initiated in Q2 2021. Samples were transported between Base Metallurgical Laboratories and Steinert, Germany, by air and ground courier. Metallurgical test work, assays, mineralogy, comminution tests, and final reporting were completed by September 2022.

Metallurgical test work, and associated assays, including Zn, Pb, and Ag assays of heads, tails, and cleaner concentrates were performed by Base Metallurgical Laboratories Ltd., Kamloops, British Columbia (Independent laboratory). Rougher flotation batch tests used a representative 2 kg split, except for composite High Grade 3 that used a 1 kg split. Rougher concentrates were used as inputs for the cleaner tests following re-grinding. Cleaner test sample sizes varied depending on the mass pull to the rougher concentrates (Table 2). Extended multi-element assays of zinc concentrates were performed by ActLabs of Ancaster, Ontario (Independent laboratory) by sodium peroxide fusion ICP-OES and ICP-MS, Hg-cold vapour atomic absorption and aqua regia ICP-MS. Assay data verification was achieved by the analysis of laboratory standards, duplicates, and blanks. Head assays were taken in duplicate and average values are reported here. Flotation test assay data were verified through the comparison of recalculated and measured heads. Sample size for Bond mill work index tests was 750 ml. SAG mill comminution tests used 100 pieces of cut drill-core.

#### *Qualified Person Statement*

Technical information in this news release has been approved by Jack Milton, P.Geo., Ph.D., Chief Geologist and a 'Qualified Person' as defined under Canadian National Instrument 43-101.

About Fireweed Metals Corp. (TSXV: FWZ; OTCQB: FWEDF; FSE:20F): Fireweed Metals is a public mineral exploration company on the leading edge of Critical Minerals project development. The Company has three projects located in northern Canada:

- Macmillan Pass Zinc-Lead-Silver Project: Fireweed owns 100% of the district-scale 940 km<sup>2</sup> Macmillan Pass project in Yukon, Canada, which is host to the Tom and Jason zinc-lead-silver deposits with current Mineral Resources and a PEA economic study (see Fireweed news releases dated 10<sup>th</sup> January 2018, and 23<sup>rd</sup> May 2018, respectively, and reports filed on [www.sedar.com](http://www.sedar.com) for details) as well as the Boundary Zone, Boundary Zone West, Tom North Zone and End Zone which have significant zinc-lead-silver mineralization drilled but not yet classified as mineral resources. The project also includes large blocks of adjacent claims with known showings and significant upside exploration potential. A large, four-rig 2022 drill program is now complete and assay results are pending.
- Mactung Tungsten Project: The Company has a binding Letter of Intent to acquire 100% interest in the 37.6 km<sup>2</sup> Mactung Tungsten Project located adjacent to the Macmillan Pass Project. Mactung contains historic resources that make it one of the largest and highest-grade undeveloped tungsten resources in the world. Located in Canada, it is one of the rare large tungsten resources outside of China. Due diligence and validation work on historic data as well as relogging and sampling of historic drill core is underway and will support a new mineral resource estimate.
- Gayna River Zinc-Gallium-Germanium Project: Fireweed has 100% of the 128.75 km<sup>2</sup> Gayna River project located 180 kilometres north of the Macmillan Pass project. It is host to extensive critical minerals mineralization including zinc, gallium and germanium as well as lead and silver, outlined by 28,000 metres of historic drilling and significant upside potential. The 2022 field program of airborne LiDAR topographic surveying, and ground geophysics was recently completed and data is being interpreted toward defining 2023 drill targets.

In Canada, Fireweed (TSXV: FWZ) trades on the TSX Venture Exchange. In the USA, Fireweed (OTCQB: FWEDF) trades on the OTCQB Venture Market for early stage and developing U.S. and international companies and is DTC eligible for enhanced electronic clearing and settlement. The Company is current in its reporting and undergoes an annual verification and management certification process. Investors can find Real-Time quotes and market information for the Company on [www.otcmarkets.com](http://www.otcmarkets.com). In Europe, Fireweed (FSE: 20F) trades on the Frankfurt Stock Exchange.

Additional information about Fireweed and its projects can be found on the Company's website at [www.FireweedMetals.com](http://www.FireweedMetals.com) and at [www.sedar.com](http://www.sedar.com).

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*"Brandon Macdonald"*

CEO & Director

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#### Cautionary Statements

##### *Forward Looking Statements*

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Photos accompanying this announcement are available at

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