# Happy Creek's Fox now at 4.8 million Kg WO3 indicated and 6.9 million Kg WO3 inferred

written by Raj Shah | February 28, 2018

February 27, 2018 (Source) – Happy Creek Minerals Ltd. (TSXV: HPY) (the "Company"), is pleased to announce an update to its mineral resource estimate completed in accordance with NI 43-101 for the Ridley Creek and BN zones, as well as a first-time resource estimate for the BK zone on its 100% owned Fox tungsten property. The Fox property is located 75 km northeast of 100 Mile House in the south-central Cariboo region of British Columbia, Canada.

The Fox property contains a recently discovered, large scale, 10 km by 3 km tungsten skarn mineral system containing seven mineralized zones and numerous showings at surface. The current resource is for the Ridley Creek, BN and BK Zones, which are portions of a 3 km long skarn horizon that outcrops at surface and dips gently westward.

The total Indicated Resources for the Ridley Creek zone amount to 582,400 tonnes grading 0.826% WO3 and the total Inferred Resource is now 565,000 tonnes grading 1.231% WO3 for the Ridley Creek, BN and BK Zones combined. Based on what is now among the highest cut-off grades reported in the industry, this represents an increase in contained tungsten of 21% for indicated and 22.9% for inferred from the previously reported January 2017 resource estimates and demonstrates the continuing increase in scale of the project as work proceeds. The selected cut-off for the

material amenable to open pit extraction is 0.175% WO3and for material amenable to underground extraction, a cut-off of 0.45% WO3 was applied.

Table 1: Resource Estimate at 0.175% WO3 and 0.45% WO3 Cut-off

| ZONE | CLASSIFICATION | Cut-off WO3 (%) | Tonnes (t) | WO3 (%) | WO3 MTU | WO3 (kg) Contained |
|---|---|---|---|---|---|---|
| Ridley Creek | Indicated in-pit | >0.175 | 397,400 | 0.713 | 283,400 | 2,834,000 |
| Ridley Creek | Indicated - underground | >0.45 | 185,000 | 1.067 | 197,100 | 1,970,600 |
| Ridley Creek zone | Indicated total | | 582,400 | 0.826 | 480,500 | 4,805,000 |
| Ridley Creek | Inferred in-pit | >0.175 | 14,700 | 0.662 | 9,700 | 97,000 |
| Ridley Creek | Inferred - underground | >0.45 | 76,800 | 0.961 | 73,800 | 738,100 |
| BN | Inferred - underground | >0.45 | 453,000 | 1.321 | 598,300 | 5,983,200 |
| BK | Inferred in-pit | >0.175 | 20,900 | 0.672 | 14,000 | 140,400 |
| Ridley Creek, BN, BK | Inferred total | | 565,400 | 1.231 | 695,800 | 6,959,100 |

Note: Cut-off determined by using a WO3 price of CDN$285/MTU WO3 in concentrate.

David Blann, P.Eng., President and CEO, comments: “This update has added more quality resources and is another step forward for the Fox property. It remains among the highest grade in the western world, comparable to the now closed Cantung mine in the Yukon/Northwest Territories, and the Fox is much closer to infrastructure and in a better operating climate. We have not yet included the potential for by-products zinc, indium, bismuth, gold and silver values which would require more detailed metallurgical testing for a more advanced economic study. The three zones with resources remain open to expansion and comprise a portion of a three-kilometre-long horizon having wide gaps that remain un-tested by drilling. In addition, the South Grid and Nightcrawler Zones have both returned positive

drill intercepts to follow up that are well above cut-off. With the current resource and clear opportunity to expand it, we are confident that the project can progress to the next stage of development and have initiated engineering and environmental-related data collection for more advanced permitting and economic study. The Fox property continues to advance as a new high-grade tungsten project in the western world."

Table 2a, b, c and d, show the sensitivity of the model to changes in cut-off with the selected cut-off highlighted.

Table 2a: Sensitivity to cut-off grade for the Ridley Creek zone within the resource constraining pit shell

| Zone | Classification | WO3 Cut-off (%) | Tonnage (T) | WO3 (%) | WO3 (MTU) |
|---|---|---|---|---|---|
| RC Zone within the resource constraining shell | Indicated | > 0.40 | 353,000 | 0.765 | 270,000 |
| | | > 0.35 | 368,000 | 0.749 | 275,700 |
| | | > 0.30 | 377,700 | 0.738 | 278,900 |
| | | > 0.20 | 392,700 | 0.720 | 282,600 |
| | | > 0.175 | 397,400 | 0.713 | 283,400 |
| | | > 0.15 | 403,500 | 0.705 | 284,400 |
| | Inferred | > 0.40 | 13,400 | 0.692 | 9,300 |
| | | > 0.35 | 14,200 | 0.673 | 9,600 |
| | | > 0.30 | 14,700 | 0.662 | 9,700 |
| | | > 0.20 | 14,700 | 0.662 | 9,700 |
| | | > 0.175 | 14,700 | 0.662 | 9,700 |
| | | > 0.15 | 14,700 | 0.662 | 9,700 |

Table 2b: Sensitivity to cut-off grade for the Ridley Creek zone below the resource constraining shell (Underground amenable)

| Zone | Classification | WO3 Cut-off (%) | Tonnage (T) | WO3 (%) | WO3 (MTU) |
|---|---|---|---|---|---|
| RC Zone Below the resource constraining shell | Indicated | > 0.70 | 141,800 | 1.217 | 172,500 |
| | | > 0.60 | 159,200 | 1.156 | 184,000 |
| | | > 0.55 | 166,300 | 1.131 | 188,000 |
| | | > 0.50 | 173,100 | 1.107 | 191,600 |
| | | > 0.45 | 184,700 | 1.067 | 197,100 |
| | | > 0.40 | 198,500 | 1.022 | 202,900 |
| | | > 0.30 | 228,800 | 0.933 | 213,400 |
| | Inferred | > 0.70 | 54,200 | 1.118 | 60,600 |
| | | > 0.60 | 64,800 | 1.041 | 67,400 |
| | | > 0.55 | 69,600 | 1.009 | 70,200 |
| | | > 0.50 | 72,900 | 0.988 | 72,000 |
| | | > 0.45 | 76,800 | 0.961 | 73,800 |
| | | > 0.40 | 84,500 | 0.913 | 77,100 |
| | | > 0.30 | 92,300 | 0.866 | 79,900 |

Table 2c: Sensitivity to cut-off grade for the BN Zone Inferred resource amenable to underground extraction.

| Zone | Classification | WO3 Cut-off (%) | Tonnage (T) | WO3 (%) | WO3 (MTU) |
|---|---|---|---|---|---|
| BN Zone | Inferred | > 0.70 | 321,400 | 1.634 | 525,100 |
| | | > 0.60 | 360,500 | 1.527 | 550,400 |
| | | > 0.55 | 381,100 | 1.475 | 562,300 |
| | | > 0.50 | 420,000 | 1.387 | 582,600 |
| | | > 0.45 | 453,000 | 1.321 | 598,300 |
| | | > 0.40 | 498,800 | 1.238 | 617,800 |
| | | > 0.30 | 655,100 | 1.027 | 672,700 |

Table 2d: Sensitivity to cut-off grade for the BK Zone Inferred resource within the resource constraining pit shell

| Zone | Classification | WO3 Cut-off (%) | Tonnage (T) | WO3 (%) | WO3 (MTU) |
|---|---|---|---|---|---|
| BK Zone | Inferred | > 0.40 | 20,100 | 0.685 | 13,800 |
| | | > 0.35 | 20,600 | 0.677 | 14,000 |
| | | > 0.30 | 20,600 | 0.677 | 14,000 |
| | | > 0.20 | 20,900 | 0.672 | 14,000 |
| | | > 0.175 | 20,900 | 0.672 | 14,000 |
| | | > 0.15 | 20,900 | 0.672 | 14,000 |

Table 3: Change from previous estimate

| Date | February 2018 Resource | | | January 2017 Resource | | | | Difference | |
|---|---|---|---|---|---|---|---|---|---|
| Zones | RC + BN + BK Zones | | | RC+ BN Zones | | | | | |
| WO3% Cut-off | > 0.175 OP and > 0.450 UG | | | > 0.2 OP and > 0.55 UG | | | | | |
| Classification | Tonnage (T) | WO3 (%) | WO3 (MTU) | Tonnage (T) | WO3 (%) | WO3 (MTU) | Tonnage % Diff. | Grade Diff. | MTU % Diff |
| Indicated | 582,400 | 0.826 | 480,500 | 486,000 | 0.818 | 397,000 | 19.8% | 0.01 | 21.0% |
| Inferred | 565,400 | 1.231 | 695,800 | 361,000 | 1.568 | 566,000 | 56.6% | -0.34 | 22.9% |

The quantity and grade of reported Inferred resources in this estimation must be regarded as conceptual in nature and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological grade or quality of continuity. For these reasons, an inferred resource has a lower level of confidence than an indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

Mineral Resources that are not Mineral Reserves do not have

demonstrated economic viability.

Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grade, and contained metal content in all tables presented in this press release

Tungsten assays are reported in percent $WO_3$ (tungsten trioxide), the chemical compound for which tungsten market prices are published. Quantities of $WO_3$ are traditionally reported in Metric Ton Units, which are equal to 10 kg of $WO_3$. For example, a grade of 0.8% $WO_3$ contains 8 kg of $WO_3$/tonne.

A NI 43-101 technical report for the Fox Tungsten Project mineral resource estimate will be filed on SEDAR within 45 days.

**NOTES ON THE MINERAL RESOURCE ESTIMATE PARAMETERS AND METHOD**

- Mineral resources are estimated in conformance with the CIM Mineral Resource definitions referred to in NI 43-101 Standards of Disclosure for Mineral Projects. This mineral resource estimate is an update of the January 26th, 2017 estimate conducted by AGP Mining Consultants Inc. covering the Ridley Creek Zone (RC Zone) and the BN Zone. The estimate is also a first-time resource estimate for the BK Zone.
- The estimate was completed based on the concept of a small scale, open pit for the BK Zone, a small scale open pit and underground room and pillar operation for the RC Zone and a small scale, underground room and pillar mining operation for the BN Zone. No other zones on the Fox Tungsten Project were evaluated.
- All samples prior to the 2016 drill campaign were sent to the Agat Laboratory facility in Vancouver, B.C., using a chain of custody, where they were prepared and analyzed

first with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For samples within and adjacent to the tungsten-mineralized domain, a peroxide fusion digestion and ICP/OES finish was performed in triplicate and averaged, providing results in percent W (tungsten). A portion of these that returned greater than 0.6% tungsten, were again repeated using XRF analyses.

- For the 2016 drill campaign, the samples were sent to SGS Laboratory facility located in Vancouver. Samples were crushed to 90% passing 2mm. A 250g split was pulverized to 85% passing 75 microns. The samples were first analysed with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For tungsten, all samples were analysed using a peroxide fusion digestion and ICP/AES finish. Over limits tungsten samples were re-analysed with pyrosulphate fusion XRF.
- For the 2017 drill campaign, the samples were sent to SGS Laboratory facility located in Vancouver. Samples preparation remain the same as samples submitted during the 2016 drill campaign. In 2017, the samples were first analysed with an aqua regia digest and ICP-ICP/MS finish to provide a multi-element analyses. For tungsten, samples grading above 40 ppm W were analysed using a peroxide fusion digestion and ICP/AES finish. Over-limit tungsten samples were re-analysed with pyrosulphate fusion XRF.
- The quality control and quality assurance program remain the same as previous years. For every 10 samples submitted, Happy Creek Mineral inserted either a blank, a certified reference standard, or a ¼ core duplicate sample in the sequence. In addition, Agat and SGS Laboratory conducts its own quality assurance/quality control (QA/QC) and reports these with every work order.
- The RC Zone model was interpolated with 81 core holes and 23 trenches completed by Happy Creek from 2010 through to

2017, totalling 5,612 metres and containing 2,214 assays. The BN Zone model is supported by 52 drill holes completed by Happy Creek in 2016 and 2017 totalling 6,366 meters of drilling and containing 1,213 assays. The BK Zone model is supported by 6 drill holes and 12 trenches, totalling 308 metres and containing 96 assays.

- The 3D wireframes developed to control the grade interpolation of the resource model were based primarily on lithology and included the construction of a mineralized wireframe within the calc-silicate/skarn lithology to control the extent of the mineralization to reasonable distance from the drill data. At the RC and BK Zones the models were enhanced by the addition of the high grade probabilistic model in order to reduce the dilution of the higher-grade material with the adjoining lower-grade material. This methodology assumes a certain degree of selectivity which can be achieved via the selection of small equipment, mining on 2.5-meter flitches and the use of UV lamps.
- Happy Creek preferentially samples the drill core in either 1 m or 2 m intervals. The nominal composite length was 2.5 m. The composite intervals were created moving downward from the collar of the drill hole toward the bottom of the drill hole. Composites lengths are automatically adjusted by the software to leave no remnants at the lithological boundaries.
- For the treatment of outliers on the RC Zone, raw assays were capped at 8.0% and 0.18 % $WO_3$ in the CSSK (calc-silicate) and GRA (granite) domains in combination with a search restriction applied on the low-grade composite values greater than 1.0% $WO_3$. The procedure used allows the deposit to retain the high-grade assays while limiting their influence during the interpolation to a maximum of 60 m x 38 m x 15 m (length x width x height). The BN Zone

assays were capped at 6% $WO_3$ and for the BK Zone, raw assays were capped at 3.8% and 0.08 % $WO_3$ in the CSSK (calc-silicate) and GRA (granite) domains. A high-grade search restriction was not necessary for BN and BK since the coefficient of variation was less than 2.0 indicating the data does not show a high variability.

- Densities were determined from 1045 representative rock samples from the RC and BN Zone using industry standard methods. For the material within the mineralized zone, a density of 2.85 g/$cm^3$ was applied to the calc-silicate lithology, and 2.68 g/$cm^3$applied to the granite lithology. The calc-silicate mineralization at the BN zone was assigned a density of 2.84. For the material within the mineralized zone on the BK zone, a density of 2.86 g/$cm^3$ was applied to the calc-silicate lithology, and 2.65 g/$cm^3$applied to the granite lithology.
- A (3D) geological and block model was generated using Geovia Gems software. The block model matrix size of 5 m x 5 m x 2.5 m (width x length x height) was selected with consultation with the engineering team from AGP and was based on the size deemed suitable for an open pit mining scenario drilling in 5-meter bench and mining in 2.5-meter flitches on the RC and BK Zone. The model matrix is also suitable for a room and pillar operation at the RC and BN Zone.
- A good variogram was obtained using the 3D data within the RC Zone mineralized envelope. The direction and plunge represented by the variogram coincide with the known interpreted plunge of the mineralization at the RC Zone. The nugget effect is moderate, at 55% of the sill value. At 96% of the sill, the maximum range is a little less than 100 m. The definition of the variogram near the origin was reasonable. The grade model was interpolated

using ordinary kriging and validated using inverse distance squared and nearest neighbour models. A variogram was attempted for the BN zone. Results were disappointing in term of orientation but sufficient to confirm the range used in the grade estimation.

- The interpolation was carried out in multiple passes with increasing search ellipsoid dimensions. For all zones, the classification was based primarily on the pass number, followed by an adjustment to the class model, based on diamond drilling density (core area), the distance to the closest sample. The krige efficiency was used as a modifier on the RC Zone.
- No mining plans have yet been completed for the deposit; however, from the geometry of the deposit, it seems likely that open pit mining, followed by an underground operation, may be considered for future extraction of the RC Zone. The BN Zone will likely be mined via a room and pillar operation with ramp access and the BK zone will likely be mined by open pit only.
- Preliminary metallurgical test work to date is based on several surface bulk samples and indicates the scheelite (tungsten mineral) can be recovered using primarily gravity methods and/or flotation to produce potentially acceptable commercial grades and containing no deleterious elements that would affect its ability to be sold. Potential by-products of zinc indium, bismuth, gold and silver have not been included in the resource estimate at this stage, but may be included in a future PEA, after more detailed metallurgy is performed.
- Under CIM definitions, Mineral Resources should have a reasonable prospect of economic extraction. A tungsten price of US$230/MTU of $WO_3$ in concentrate was used for the cut-off estimation. To assess the Mineral Resources, an in-situ resource cut-off grade of 0.175% $WO_3$ has been

applied for potential open pit resources and 0.45% $WO_3$ for potential underground material.

- To further assess reasonable prospects of economic extraction, Lerchs-Grossman optimized shells were generated to constrain the potential open pit material. Parameters used included:
  - 50° slopes for the pit shell
  - CDN$8/t mining, CDN$26/t milling, CDN$10/t G&A operating costs
  - 75.8% $WO_3$ recovery to a 68% $WO_3$ concentrate
  - CDN$285/MTU $WO_3$ price
  - economics applied to Indicated and Inferred materials.

**Qualified Persons**

David Blann, P.Eng., Director of the Company, is a Qualified Person as defined by National Instrument 43-101 and is responsible for the overall preparation and approval of the technical information disclosed in the news release.

Pierre Desautels, P.Geo. Principal Resource Geologist of AGP Mining Consultants Inc. Qualified Person under NI 43-101 who is independent of the Company, has prepared and authorized the release of the mineral resource estimates presented herein. Jay Melnyk, Eng., Principal Mining Engineer of AGP Mining Consultants Inc. and Qualified Person under NI 43-101 guidelines has reviewed the technical content of the News Release in relation to cut-off determination and the resource constraining shell.

On behalf of the Board of Directors,

*“David E Blann”*

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David E Blann, P.Eng.

President, CEO

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*David Blann, P.Eng., Director, is a Qualified Person as defined by National Instrument 43-101 and is responsible for the preparation and approval of the technical information disclosed in the news release.*

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