

Fermont  
November 1st, 2022

Marc-Antoine Perron  
Quebec Iron Ore  
755 389 road  
Fermont, QC, G0G 1J0  
Bloom Lake Mine (Canada)

to whom it may concern

**Re :** Letter of reference for ground improvement and cut-off wall executed by  
BAUER Foundation

Dear Sirs and Madam,

Following the successful completion of BAUER's part of the project, I would like to express my appreciation for the means and methods in which BAUER has performed on the project.

The mine is located approximately 13km north of Fermont, Quebec, and 10 km north of the Mont-Wright iron ore mining complex belonging to ArcelorMittal Mines Canada. Now in commercial production since June 2018, the Bloom Lake Mine has proven its ability to economically produce high-grade 66.2% Fe iron ore at or above its nameplate capacity of 7.4 Mtpa.

BAUER Foundations Canada Inc., a subsidiary of BAUER Spezialtiefbau GmbH, has been engaged by Quebec Iron Ore for construction works at Bloom Lake mine for year 2021. The work consisted of improving the backfill density of the Dike East to enhance its stability prior to raising its profile. The second part consisted of improving the sealing of the existing till core and foundation of Dike A with a cut-off wall to enhances its stability prior to raising its profile and in preparation to raise the water level in the upstream basin. Both projects are utilized to service the additional tonnage.

BAUER's scope of work included the following:

Dike A

Diaphragm wall

The 200 m long cut -off that is consists of 73 panels (2800 mm x 800 mm) with 40 - 45 cm over cut at the beginning. The over cut was then reduced to 30 cm following

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the client review of BAUER's verticality records. The panels had 1.5 m socket into bedrock with total panel depth varying between 20 - 30 m following the bedrock profile. The excavation consisted of 3,700 m<sup>2</sup> of overburden, 21 m<sup>2</sup> of weathered rock and 273 m<sup>2</sup> of sound rock

#### Dike East

Ground improvement with stone columns

1,416 stone columns at 2.75 m spacing; length up to 8 m, minimum 3.5 m; Diameter: 900 mm. Pre-drilling was an option at the site, however, it was not necessary as the vibro set-up was able to achieve the desirable results without predrilling.

#### Details of the Contract

Execution period:

- June 2021 – November 2021

Location:

The Bloom Lake Mine located approximately 13 km north of Fermont, Quebec and around 800 km northeast of Montreal.

Geological condition:

Dike A

- Overburden: Till core layer (consists of silt and sand with a little gravel and traces of clay along with boulders) and a layer of natural till just above.
- Sound bedrock encountered at the majority of the panel with pocket of weathered at few locations.

Dike East

- Sand with traces of silt (Coarse waste fill), and silt, sandy (Tailing)

One of the main challenges was the mobilization of equipment, given the remote location of the site. Equipment was mobilized from across Canada and elsewhere in the world to ensure that necessary equipment was made available for the project.

Conclusion :

The professional way in which the BAUER executive team prepared and executed the works was very well received. Trial mixes and generally quality management and control along the detailed method statement secured the highest standards of quality for the product.

The work carried out in constructing the works in Québec was very professional. BAUER was proactively seeking solutions, addressing issues, and were answering

questions related to any subjects of the works.

Yours faithfully



Marc-Antoine Perron, P. Eng.  
Project superintendant - GDRE  
Quebec Iron Ore

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