

**Metso:Outotec**

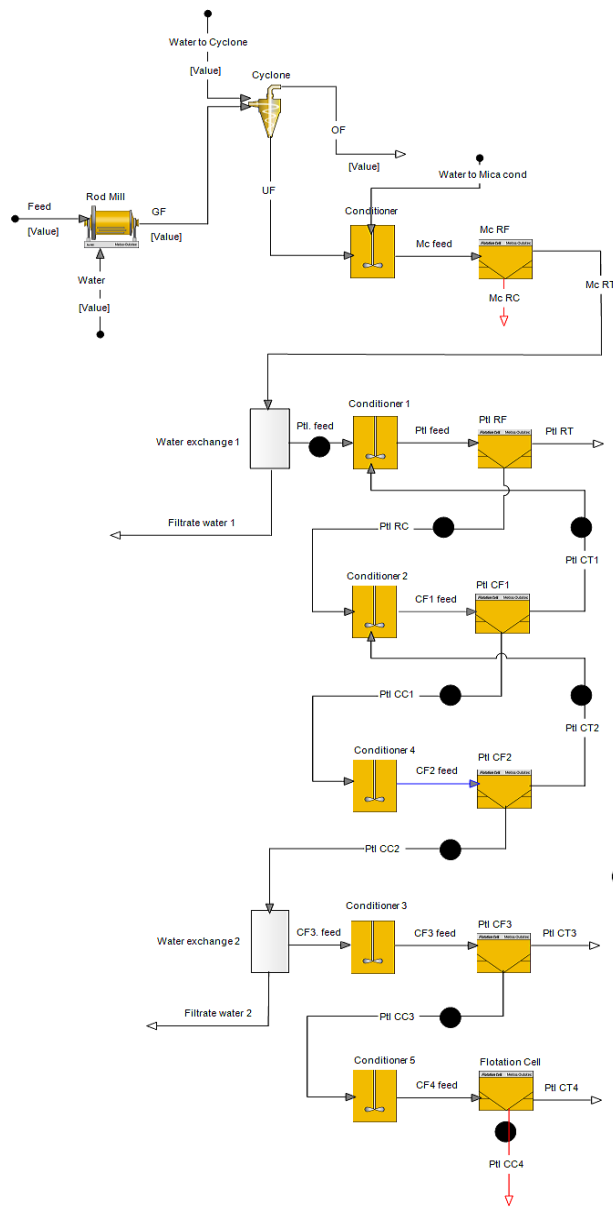
**RESTRICTED**

February 16, 2023

**UKRLithium – LCT results  
Polokhivske Li-bearing ore**

**Progress meeting 9**

# 1. Process developed flowsheet for Polokhivske Li-bearing ore



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## 2. Experimental conditions

The following changes have been made after the 3rd cycle:

No changes made on the dosage of HF and collector at RF circuit.

Petalite RF - Flotation time was extended by 1 minute.

Feldspar CF1, CF2 – Collector dosages were increased by 100g/t and 20g/t, respectively.

| Unit Name        | Event Name                     | Duration        | Adjustment       | Collector               | Depressant     | Collector                       | Collector                |
|------------------|--------------------------------|-----------------|------------------|-------------------------|----------------|---------------------------------|--------------------------|
|                  |                                |                 | pH<br>HCl, 27.5% | Flotigam EDA, 1%<br>g/t | HF, 40%<br>g/t | Flotigam K2C : PEG 860<br>70/30 | Flotigam 4343, 1%<br>g/t |
| Rod mill         | Grinding                       | 54 min          |                  |                         |                |                                 |                          |
| Hydrocyclone     | Desliming                      |                 |                  |                         |                |                                 |                          |
| Mica Cond        | Conditioning                   | 3 min           | pH=2.4           | 150g/t                  |                |                                 |                          |
| Mica RF          | Mica flotation                 | 1 min           |                  |                         |                |                                 |                          |
| Ptl Rougher Cond | Brine (5%/5%)<br>pH adjustment |                 | pH=3.7-4.0       |                         |                |                                 |                          |
|                  | Conditioning                   | 5 min           |                  |                         | 2000g/t        |                                 |                          |
|                  | pH adjustment<br>Conditioning  | 3 min           | pH=2.5<br>pH=2.5 |                         |                | 650g/t                          |                          |
| RF1              | Flotation                      | 3 min + 0.5 min |                  |                         |                |                                 |                          |
| RF2              | pH measurement                 |                 |                  |                         |                |                                 |                          |
|                  | pH adjustment                  |                 | pH=2.5           |                         |                |                                 |                          |
|                  | Conditioning                   | 5 min           |                  |                         | 500g/t         |                                 |                          |
|                  | pH adjustment                  |                 | pH=2.5           |                         |                |                                 |                          |
|                  | Conditioning                   | 3 min           |                  |                         |                | 200g/t                          |                          |
|                  | pH adjustment<br>Flotation     | 3 min + 0.5 min | pH=2.5           |                         |                |                                 |                          |
| RC               | Blend of concentrates          |                 |                  |                         |                |                                 |                          |
| Ptl Cleaner Cond | pH adjustment                  |                 | pH=2.5           |                         |                |                                 |                          |
|                  | Conditioning                   | 3 min           |                  |                         | 500g/t         |                                 |                          |
|                  | Conditioning                   | 3 min           | pH=2.5           |                         |                | 100g/t +100g/t                  |                          |
| CF1              | Flotation                      | 4 min           |                  |                         |                |                                 |                          |
| CF2              | Conditioning                   | 5 min           |                  |                         | 500g/t         |                                 |                          |
|                  | Conditioning                   | 3 min           | pH=2.5           |                         |                | 20g/t + 20g/t                   |                          |
|                  | Flotation                      | 3 min           |                  |                         |                |                                 |                          |
| CF3              | Conditioning                   | 5 min           |                  |                         | 1000g/t        |                                 |                          |
|                  | Conditioning                   | 3 min           | pH=2.5           |                         |                |                                 | 80g/t                    |
|                  | Flotation                      | 3 min           |                  |                         |                |                                 |                          |
| CF4              | pH adjustment                  |                 | pH=2.5           |                         |                |                                 |                          |
|                  | Conditioning                   | 3 min           |                  |                         | 500g/t         |                                 |                          |
|                  | Conditioning                   | 3 min           | pH=2.5           |                         |                |                                 | 20g/t                    |
|                  | Flotation                      | 3 min           |                  |                         |                |                                 |                          |

# 3. Summary results of each round of LCT

## Overall results of all streams – Summary Table

| Round           |                               | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     |
|-----------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>LCT Feed</b> | Mass, g                       | 1824  | 1789  | 1783  | 1785  | 1794  | 1807  | 1810  | 1827  |
|                 | Mass pull, %                  | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|                 | Li <sub>2</sub> O, %          | 1.31  | 1.31  | 1.31  | 1.31  | 1.31  | 1.31  | 1.31  | 1.31  |
|                 | Li <sub>2</sub> O, recovery % | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| <b>OF slime</b> | Mass, g                       | 233   | 227   | 246   | 224   | 232   | 242   | 242   | 242   |
|                 | Mass pull, %                  | 12.8  | 12.7  | 13.8  | 12.5  | 12.9  | 13.4  | 13.4  | 13.3  |
|                 | Li <sub>2</sub> O, grade %    | 1.23  | 1.23  | 1.23  | 1.23  | 1.23  | 1.23  | 1.23  | 1.23  |
|                 | Li <sub>2</sub> O, recovery % | 11.99 | 11.90 | 12.94 | 11.73 | 12.09 | 12.57 | 12.45 | 12.43 |
| <b>Mica RC</b>  | Mass, g                       | 73    | 120   | 80    | 95    | 95    | 70    | 97    | 114   |
|                 | Mass pull, %                  | 4.0   | 6.7   | 4.5   | 5.3   | 6.9   | 3.9   | 5.4   | 6.2   |
|                 | Li <sub>2</sub> O, grade %    | 1.66  | 1.68  | 1.81  | 1.77  | 1.65  | 1.71  | 1.74  | 1.81  |
|                 | Li <sub>2</sub> O, recovery % | 5.07  | 8.57  | 6.19  | 7.20  | 8.64  | 5.07  | 7.16  | 8.59  |
| <b>Ptl RT</b>   | Mass, g                       | 513   | 657   | 785   | 847   | 912   | 945   | 756   | 821   |
|                 | Mass pull, %                  | 28.1  | 36.7  | 44.0  | 47.5  | 50.8  | 52.3  | 41.8  | 44.9  |
|                 | Li <sub>2</sub> O, grade %    | 0.56  | 0.58  | 0.62  | 0.63  | 0.60  | 0.57  | 0.67  | 0.67  |
|                 | Li <sub>2</sub> O, recovery % | 12.02 | 16.29 | 20.97 | 22.86 | 23.28 | 22.75 | 21.12 | 22.89 |
| <b>Ptl CT1</b>  | Mass, g                       |       |       |       |       |       |       |       | 646   |
|                 | Li <sub>2</sub> O, grade %    |       |       |       |       |       |       |       | 1.10  |
|                 | Li <sub>2</sub> O, recovery % |       |       |       |       |       |       |       | 29.6  |
| <b>Ptl CT2</b>  | Mass, g                       |       |       |       |       |       |       |       | 303   |
|                 | Li <sub>2</sub> O, grade %    |       |       |       |       |       |       |       | 1.64  |
|                 | Li <sub>2</sub> O, recovery % |       |       |       |       |       |       |       | 20.7  |
| <b>Ptl CT3</b>  | Mass, g                       | 130   | 150   | 86    | 137   | 164   | 191   | 209   | 216   |
|                 | Mass pull, %                  | 7.1   | 8.4   | 4.8   | 7.7   | 9.1   | 10.6  | 11.5  | 11.8  |
|                 | Li <sub>2</sub> O, grade %    | 0.11  | 0.14  | 0.17  | 0.14  | 0.16  | 0.15  | 0.15  | 0.19  |
|                 | Li <sub>2</sub> O, recovery % | 0.58  | 0.91  | 0.62  | 0.82  | 1.14  | 1.20  | 1.31  | 1.72  |
| <b>Ptl CT4</b>  | Mass, g                       | 18    | 19    | 8     | 13    | 22    | 24    | 29    | 35    |
|                 | Mass pull, %                  | 1.0   | 1.1   | 0.5   | 0.7   | 1.2   | 1.3   | 1.6   | 1.9   |
|                 | Li <sub>2</sub> O, grade %    | 0.34  | 0.58  | 0.65  | 0.45  | 0.67  | 0.47  | 0.48  | 0.47  |
|                 | Li <sub>2</sub> O, recovery % | 0.26  | 0.48  | 0.22  | 0.25  | 0.63  | 0.47  | 0.58  | 0.67  |
| <b>Ptl CC4</b>  | Mass, g                       | 289   | 308   | 256   | 308   | 368   | 399   | 375   | 393   |
|                 | Mass pull, %                  | 15.9  | 17.2  | 14.4  | 17.2  | 20.5  | 22.1  | 20.7  | 21.5  |
|                 | Li <sub>2</sub> O grade %     | 3.44  | 3.44  | 3.68  | 3.49  | 3.49  | 3.38  | 3.34  | 3.30  |
|                 | Li <sub>2</sub> O recovery %  | 41.69 | 45.33 | 40.35 | 45.87 | 54.67 | 56.95 | 52.37 | 54.13 |

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In total, 2700g of petalite concentrate was produced from LCT.