

## Supplementary Materials:

**Table S1.** Determination of minerals and their recovery after treatments of flocculation and use of membrane technology to selected samples of process waters LS and HS from different dates. LOD = Level of Detection, LOQ = Level of Quantification.

| Sample | Collected in | Description                  | Element                              | Ca    | Ca                      | Mn    | Mn                      | Fe    | Fe                      | Cu     | Cu                      | Zn     | Zn                      | Cd    |
|--------|--------------|------------------------------|--------------------------------------|-------|-------------------------|-------|-------------------------|-------|-------------------------|--------|-------------------------|--------|-------------------------|-------|
|        |              |                              | Isotope used for determination (amu) | 44    | Sedimented or recovered | 55    | Sedimented or recovered | 57    | Sedimented or recovered | 63     | Sedimented or recovered | 66     | Sedimented or recovered | 111   |
|        |              |                              | unit                                 | g/kg  | %                       | mg/kg | %                       | mg/kg | %                       | mg/kg  | %                       | mg/kg  | %                       | mg/kg |
| LS     | 9-Mar        | No treatment                 |                                      | 0.103 |                         | 0.044 |                         | 0.277 |                         | 0.006  |                         | 0.255  |                         | <LOQ  |
| LS     | 9-Mar        | Levasil 1.23% and 0 hour     |                                      | 0.069 | 32.6                    | 0.006 | 85.1                    | 0.085 | 69.2                    | 0.006  | -0.2                    | 0.080  | 68.7                    | <LOQ  |
| HS     | 21-Feb       | No treatment                 |                                      | 0.179 |                         | 0.124 |                         | 0.447 |                         | 0.011  |                         | 0.796  |                         | <LOQ  |
| HS     | 21-Feb       | Levasil 1.23% and 0 hour     |                                      | 0.087 | 51.4                    | 0.010 | 92.1                    | 0.147 | 67.0                    | 0.007  | 32.5                    | 0.060  | 92.5                    | <LOQ  |
| LS     | 25-Apr       | No treatment                 |                                      | 0.149 |                         | 0.050 |                         | 0.370 |                         | 0.069  |                         | 0.119  |                         | <LOQ  |
| LS     | 25-Apr       | Levasil 0.15% and 1 hour     |                                      | 0.115 | 22.9                    | 0.017 | 65.6                    | 0.290 | 21.5                    | <LOD   |                         | 0.011  | 90.6                    | <LOQ  |
| LS     | 25-Apr       | Levasil 0.25% and 1 hour     |                                      | 0.114 | 23.6                    | 0.016 | 67.6                    | 0.288 | 22.2                    | 0.050  | 27.7                    | 0.066  | 44.9                    | <LOQ  |
| LS     | 25-Apr       | Levasil 1.23% and 1 hour     |                                      | 0.105 | 29.4                    | 0.010 | 80.6                    | 0.135 | 63.6                    | <LOD   |                         | <LOD   |                         | <LOQ  |
| LS     | 25-Apr       | Levasil 0.15% and 3 hours    |                                      | 0.112 | 24.9                    | 0.008 | 83.3                    | 0.248 | 33.0                    | <LOD   |                         | <LOD   |                         | <LOQ  |
| LS     | 25-Apr       | Levasil 0.25% and 3 hours    |                                      | 0.102 | 32.0                    | 0.010 | 80.5                    | 0.205 | 44.6                    | <LOD   |                         | 0.006  | 95.0                    | <LOQ  |
| LS     | 25-Apr       | Levasil 1.23% and 3 hours    |                                      | 0.099 | 33.8                    | 0.013 | 73.2                    | 0.166 | 55.1                    | 0.003  | 95.2                    | 0.021  | 82.5                    | <LOQ  |
| HS     | 25-Apr       | No treatment                 |                                      | 0.083 |                         | 0.017 |                         | 0.415 |                         | 0.011  |                         | 0.170  |                         | <LOQ  |
| HS     | 25-Apr       | Levasil 0.15% and 1 hour     |                                      | 0.061 | 26.1                    | 0.009 | 45.1                    | 0.395 | 4.8                     | 0.003  | 67.6                    | 0.158  | 7.2                     | <LOQ  |
| HS     | 25-Apr       | Levasil 0.25% and 1 hour     |                                      | 0.060 | 27.8                    | 0.009 | 48.8                    | 0.338 | 18.6                    | 0.003  | 70.2                    | 0.094  | 44.9                    | <LOQ  |
| HS     | 25-Apr       | Levasil 1.23% and 1 hour     |                                      | 0.053 | 36.2                    | 0.010 | 41.9                    | 0.206 | 50.5                    | 0.009  | 16.1                    | 0.005  | 97.0                    | <LOQ  |
| HS     | 25-Apr       | Levasil 0.15% and 3 hours    |                                      | 0.059 | 28.4                    | 0.009 | 47.4                    | 0.360 | 13.2                    | 0.004  | 61.6                    | 0.113  | 33.6                    | <LOQ  |
| HS     | 25-Apr       | Levasil 0.25% and 3 hours    |                                      | 0.058 | 30.3                    | 0.010 | 40.3                    | 0.369 | 11.2                    | 0.060  | -458.2                  | 0.112  | 34.1                    | <LOQ  |
| HS     | 25-Apr       | Levasil 1.23% and 3 hours    |                                      | 0.058 | 29.5                    | 0.009 | 44.3                    | 0.240 | 42.2                    | 0.005  | 53.5                    | 0.019  | 88.7                    | <LOQ  |
| LS     | 28-Mar       | No treatment                 |                                      | 0.140 |                         | 0.042 |                         | 0.398 |                         | 0.024  |                         | 0.645  |                         | <LOQ  |
| LS     | 28-Mar       | Permeate A - Ultrafiltration |                                      | 0.145 | 103.7                   | 0.021 | 48.5                    | 0.304 | 76.4                    | 0.521  | 2132.0                  | 2.378  | 368.7                   | <LOQ  |
| LS     | 28-Mar       | Permeate B - Ultrafiltration |                                      | 0.147 | 104.9                   | 0.022 | 51.1                    | 0.349 | 87.8                    | 0.440  | 1801.8                  | 1.826  | 283.1                   | <LOQ  |
| LS     | 28-Mar       | Permeate C - Ultrafiltration |                                      | 0.144 | 103.1                   | 0.026 | 60.2                    | 0.415 | 104.3                   | 0.415  | 1698.2                  | 2.094  | 324.7                   | <LOQ  |
| LS     | 28-Mar       | Retentate - Ultrafiltration  |                                      | 0.340 | 243.8                   | 0.129 | 304.2                   | 1.382 | 347.2                   | 14.171 | 57996.0                 | 12.713 | 1971.2                  | <LOQ  |
| HS     | 28-Mar       | No treatment                 |                                      | 0.087 |                         | 0.020 |                         | 0.617 |                         | 0.012  |                         | 0.228  |                         | <LOQ  |
| HS     | 28-Mar       | Permeate A - Ultrafiltration |                                      | 0.055 | 62.8                    | 0.008 | 41.8                    | 0.336 | 54.6                    | 1.251  | 10094.9                 | 1.524  | 667.3                   | <LOQ  |
| HS     | 28-Mar       | Permeate B - Ultrafiltration |                                      | 0.053 | 60.8                    | 0.006 | 29.8                    | 0.414 | 67.1                    | 1.179  | 9515.0                  | 1.587  | 695.3                   | <LOQ  |
| HS     | 28-Mar       | Permeate C - Ultrafiltration |                                      | 0.048 | 55.4                    | 0.006 | 29.2                    | 0.417 | 67.6                    | 0.934  | 7533.4                  | 1.616  | 707.9                   | <LOQ  |
| HS     | 28-Mar       | Retentate - Ultrafiltration  |                                      | 0.134 | 153.3                   | 0.029 | 145.9                   | 0.862 | 139.8                   | 3.138  | 25318.3                 | 2.372  | 1038.8                  | <LOQ  |

| Sample | Collected in | Description                  | Element                              | Na    | Na                      | Mg    | Mg                      | P    | P                       | K     | K                       |
|--------|--------------|------------------------------|--------------------------------------|-------|-------------------------|-------|-------------------------|------|-------------------------|-------|-------------------------|
|        |              |                              | Isotope used for determination (amu) | 23    | Sedimented or recovered | 24    | Sedimented or recovered | 31   | Sedimented or recovered | 39    | Sedimented or recovered |
|        |              |                              | unit                                 | g/kg  | %                       | mg/kg | %                       | g/kg | %                       | g/kg  | %                       |
| LS     | 9-Mar        | No treatment                 |                                      | 50.6  |                         | 74.0  |                         | 1.16 |                         | 0.485 |                         |
| LS     | 9-Mar        | Levasil 1.23% and 0 hour     |                                      | 46.1  | 8.8                     | 4.6   | 93.7                    | 0.80 | 31.4                    | 0.410 | 15.4                    |
| HS     | 21-Feb       | No treatment                 |                                      | 39.9  |                         | 398.4 |                         | 2.76 |                         | 0.752 |                         |
| HS     | 21-Feb       | Levasil 1.23% and 0 hour     |                                      | 38.6  | 3.1                     | 5.5   | 98.6                    | 1.46 | 47.2                    | 0.767 | -2.0                    |
| LS     | 25-Apr       | No treatment                 |                                      | 53.4  |                         | 167.8 |                         | 1.76 |                         | 0.192 |                         |
| LS     | 25-Apr       | Levasil 0.15% and 1 hour     |                                      | 57.0  | -6.6                    | 34.1  | 79.7                    | 1.43 | 18.8                    | 0.196 | -1.9                    |
| LS     | 25-Apr       | Levasil 0.25% and 1 hour     |                                      | 55.3  | -3.5                    | 33.5  | 80.0                    | 1.40 | 20.5                    | 0.208 | -8.0                    |
| LS     | 25-Apr       | Levasil 1.23% and 1 hour     |                                      | 50.9  | 4.7                     | 13.0  | 92.2                    | 1.15 | 34.9                    | 0.182 | 5.3                     |
| LS     | 25-Apr       | Levasil 0.15% and 3 hours    |                                      | 55.7  | -4.3                    | 11.9  | 92.9                    | 1.32 | 24.8                    | 0.224 | -16.4                   |
| LS     | 25-Apr       | Levasil 0.25% and 3 hours    |                                      | 55.0  | -3.0                    | 14.7  | 91.2                    | 1.35 | 23.5                    | 0.201 | -4.6                    |
| LS     | 25-Apr       | Levasil 1.23% and 3 hours    |                                      | 51.0  | 4.5                     | 22.7  | 86.4                    | 1.20 | 32.0                    | 0.194 | -1.2                    |
| HS     | 25-Apr       | No treatment                 |                                      | 103.1 |                         | 15.1  |                         | 1.95 |                         | 1.005 |                         |
| HS     | 25-Apr       | Levasil 0.15% and 1 hour     |                                      | 99.2  | 3.8                     | 2.7   | 82.3                    | 1.83 | 6.2                     | 0.936 | 6.9                     |
| HS     | 25-Apr       | Levasil 0.25% and 1 hour     |                                      | 99.1  | 3.9                     | 3.2   | 78.6                    | 1.89 | 3.1                     | 0.950 | 5.5                     |
| HS     | 25-Apr       | Levasil 1.23% and 1 hour     |                                      | 97.1  | 5.8                     | 2.0   | 86.5                    | 1.73 | 11.0                    | 0.892 | 11.2                    |
| HS     | 25-Apr       | Levasil 0.15% and 3 hours    |                                      | 98.9  | 4.1                     | 3.0   | 80.3                    | 1.85 | 4.9                     | 0.965 | 4.0                     |
| HS     | 25-Apr       | Levasil 0.25% and 3 hours    |                                      | 97.7  | 5.3                     | 3.2   | 78.6                    | 1.84 | 5.4                     | 0.973 | 3.2                     |
| HS     | 25-Apr       | Levasil 1.23% and 3 hours    |                                      | 99.8  | 3.2                     | 2.5   | 83.6                    | 1.81 | 7.1                     | 0.917 | 8.7                     |
| LS     | 28-Mar       | No treatment                 |                                      | 29.9  |                         | 40.7  |                         | 2.67 |                         | 1.025 |                         |
| LS     | 28-Mar       | Permeate A - Ultrafiltration |                                      | 24.0  | 80.4                    | 26.4  | 64.9                    | 1.87 | 70.0                    | 0.809 | 79.0                    |
| LS     | 28-Mar       | Permeate B - Ultrafiltration |                                      | 28.5  | 95.6                    | 19.2  | 47.1                    | 2.34 | 87.5                    | 0.954 | 93.1                    |
| LS     | 28-Mar       | Permeate C - Ultrafiltration |                                      | 28.3  | 94.7                    | 20.2  | 49.6                    | 2.60 | 97.4                    | 0.975 | 95.1                    |
| LS     | 28-Mar       | Retentate - Ultrafiltration  |                                      | 31.3  | 104.9                   | 158.5 | 389.5                   | 4.39 | 164.4                   | 1.023 | 99.8                    |
| HS     | 28-Mar       | No treatment                 |                                      | 101.4 |                         | 19.6  |                         | 1.89 |                         | 0.870 |                         |
| HS     | 28-Mar       | Permeate A - Ultrafiltration |                                      | 86.8  | 85.6                    | 13.5  | 69.1                    | 1.22 | 64.6                    | 0.707 | 81.4                    |
| HS     | 28-Mar       | Permeate B - Ultrafiltration |                                      | 101.6 | 100.3                   | 4.7   | 23.8                    | 1.60 | 84.7                    | 0.871 | 100.2                   |
| HS     | 28-Mar       | Permeate C - Ultrafiltration |                                      | 100.3 | 99.0                    | 5.1   | 26.1                    | 1.55 | 82.1                    | 0.861 | 99.0                    |
| HS     | 28-Mar       | Retentate - Ultrafiltration  |                                      | 101.4 | 100.1                   | 28.1  | 143.6                   | 1.91 | 101.3                   | 0.845 | 97.1                    |