

## **Appendix 20**

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### **Meadowbank predicted water quantity and quality (2012-2020)**

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2012 Predicted water quantity and quality compared to the measured water quantity and quality  
MINING YEAR 3

| Water Quantity Year 3^ |                             |                            |                                            |
|------------------------|-----------------------------|----------------------------|--------------------------------------------|
| Pits                   | Predicted (m <sup>3</sup> ) | Measured (m <sup>3</sup> ) | % Difference between predicted vs measured |
| Portage                | 931 800                     | 1 026 000                  | 10                                         |
| Bay Goose              | 1 235 100                   | 499 000                    | -60                                        |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project

| Third Portage Open Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                        | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                                   |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                                |            | 6.30                      | 6.10                               | 7.80     | 7.77               | 24                                               | 28            | 23                                                                  | 27            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                        | mg CaCO3/L | 39                        | 42                                 | 92       | 56                 | 136                                              | 119           | 44                                                                  | 33            | --                              | --                | --                               |
| Ammonia (unionized)                               | mg NH3/L   | 0.00057                   | 0.0006                             | 0.2081   | 0.1000             | 36 413                                           | 34 588        | 17 444                                                              | 16 567        | 0.016                           | --                | --                               |
| Ammonia nitrogen                                  | mg N/L     | 2.3                       | 4                                  | 3.9      | 0.2                | 69                                               | 0             | -90                                                                 | -94           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                                 | mg/L       | 0.0024                    | 0.057                              | 0.0031   | 0.0025             | 29                                               | -95           | 4                                                                   | -96           | 0.005                           | 0.5               | 0.3                              |
| Chloride                                          | mg/L       | 630                       | 630                                | 20       | 7                  | -97                                              | -97           | -99                                                                 | -99           | 120                             | --                | 1000                             |
| Dissolved Copper                                  | mg/L       | 0.0014                    | 0.013                              | 0.0046   | 0.0025             | 230                                              | -64           | 79                                                                  | -81           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                          | mg/L       | 0.19                      | 0.23                               | 0.62     | 0.34               | 228                                              | 171           | 80                                                                  | 49            | 0.12                            | --                | --                               |
| Hardness                                          | mg CaCO3/L | 300                       | 310                                | 100      | 78                 | -67                                              | -68           | -74                                                                 | -75           | --                              | --                | --                               |
| Dissolved Lead                                    | mg/L       | 0.0016                    | 0.0063                             | 0.0036   | 0.0025             | 123                                              | -43           | 56                                                                  | -60           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                                  | mg/L       | 0.003                     | 0.073                              | 0.0051   | 0.0025             | 75                                               | -93           | -14                                                                 | -97           | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                                  | mg/L       | 0.040                     | 0.057                              | 0.0651   | 0.0088             | 63                                               | 14            | -78                                                                 | -85           | --                              | --                | --                               |
| Dissolved Cadmium                                 | mg/L       | 0.000074                  | 0.00023                            | 0.0025   | 0.0025             | 3 278                                            | 987           | 3 278                                                               | 987           | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                                    | mg/L       | 0.36                      | 3.7                                | 0.0328   | 0.0250             | -91                                              | -99           | -93                                                                 | -99           | 0.3                             | --                | --                               |
| Dissolved Mercury                                 | mg/L       | 0.0000057                 | 0.000044                           | 0.00025  | 0.00025            | 4 286                                            | 468           | 4 286                                                               | 468           | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                               | mg/L       | 0.19                      | 0.55                               | 0.0553   | 0.0335             | -71                                              | -90           | -82                                                                 | -94           | 0.23                            | --                | --                               |
| Dissolved Molybdenum                              | mg/L       | 0.013                     | 0.013                              | 0.0238   | 0.0193             | 83                                               | 83            | 48                                                                  | 48            | 0.073                           | --                | --                               |
| Dissolved Selenium                                | mg/L       | 0.0003                    | 0.0011                             | 0.0025   | 0.0025             | 762                                              | 127           | 762                                                                 | 127           | 0.001                           | --                | --                               |
| Dissolved Thallium                                | mg/L       | 0.00003                   | 0.0001                             | 0.0044   | 0.0050             | 14 692                                           | 4 338         | 16 567                                                              | 4 900         | 0.0008                          | --                | --                               |
| Nitrate                                           | mgN/L      | 2.60                      | 4.4                                | 7.74     | 2.96               | 198                                              | 76            | 14                                                                  | -33           | 2.94                            | --                | 20                               |
| Sulphate                                          | mg/L       | 31                        | 42                                 | 40       | 19                 | 28                                               | -6            | -39                                                                 | -55           | 128                             | --                | --                               |
| Total dissolved solids                            | mg/L       | 960                       | 990                                | 240      | 168                | -75                                              | -76           | -83                                                                 | -83           | --                              | --                | --                               |
| Dissolved Zinc                                    | mg/L       | 0.0074                    | 0.068                              | 0.0179   | 0.0025             | 142                                              | -74           | -66                                                                 | -96           | 0.013                           | 0.5               | 0.4                              |

| Goose Island Open Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|--------------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                       | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                                  |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                               |            | 6.10                      | 6.10                               | 7.75     | 7.56               | 27                                               | 27            | 24                                                                  | 24            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                       | mg CaCO3/L | 27                        | 27                                 | 85       | 55                 | 216                                              | 216           | 103                                                                 | 103           | --                              | --                | --                               |
| Ammonia (unionized)                              | mg NH3/L   | 0.00056                   | 0.00056                            | 0.2358   | 0.0250             | 42 013                                           | 42 013        | 4 364                                                               | 4 364         | 0.016                           | --                | --                               |
| Ammonia nitrogen                                 | mg N/L     | 3.6                       | 3.6                                | 5.0      | 0.6                | 40                                               | 40            | -83                                                                 | -83           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                                | mg/L       | 0.0016                    | 0.0016                             | 0.0158   | 0.0073             | 884                                              | 884           | 353                                                                 | 353           | 0.005                           | 0.5               | 0.3                              |
| Chloride                                         | mg/L       | 440                       | 440                                | 16       | 6                  | -96                                              | -96           | -99                                                                 | -99           | 120                             | --                | 1000                             |
| Dissolved Copper                                 | mg/L       | 0.00010                   | 0.001                              | 0.0150   | 0.0088             | 15 689                                           | 1 479         | 9 111                                                               | 821           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                         | mg/L       | 0.13                      | 0.13                               | 0.43     | 0.24               | 231                                              | 231           | 83                                                                  | 83            | 0.12                            | --                | --                               |
| Hardness                                         | mg CaCO3/L | 210                       | 210                                | 130      | 60                 | -38                                              | -38           | -72                                                                 | -72           | --                              | --                | --                               |
| Dissolved Lead                                   | mg/L       | 0.0011                    | 0.0011                             | 0.0144   | 0.0044             | 1 207                                            | 1 207         | 298                                                                 | 298           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                                 | mg/L       | 0.002                     | 0.002                              | 0.0194   | 0.0194             | 869                                              | 869           | 869                                                                 | 869           | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                                 | mg/L       | 0.027                     | 0.0270                             | 0.0618   | 0.0305             | 129                                              | 129           | 13                                                                  | 13            | --                              | --                | --                               |
| Dissolved Cadmium                                | mg/L       | 0.000051                  | 0.000051                           | 0.0250   | 0.0250             | 48 920                                           | 48 920        | 48 920                                                              | 48 920        | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                                   | mg/L       | 0.25                      | 0.25                               | 0.0250   | 0.0250             | -90                                              | -90           | -90                                                                 | -90           | 0.3                             | --                | --                               |
| Dissolved Mercury                                | mg/L       | 0.0000039                 | 0.0000039                          | 0.00644  | 0.00025            | 164 964                                          | 164 964       | 6 310                                                               | 6 310         | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                              | mg/L       | 0.13                      | 0.13                               | 0.1479   | 0.1109             | 14                                               | 14            | -15                                                                 | -15           | 0.23                            | --                | --                               |
| Dissolved Molybdenum                             | mg/L       | 0.0086                    | 0.0086                             | 0.0240   | 0.0240             | 179                                              | 179           | 179                                                                 | 179           | 0.073                           | --                | --                               |
| Dissolved Selenium                               | mg/L       | 0.0002                    | 0.0002                             | 0.0138   | 0.0025             | 6 775                                            | 6 775         | 1 150                                                               | 1 150         | 0.001                           | --                | --                               |
| Dissolved Thallium                               | mg/L       | 0.00002                   | 0.00002                            | 0.0050   | 0.0050             | 24 900                                           | 24 900        | 24 900                                                              | 24 900        | 0.0008                          | --                | --                               |
| Nitrate                                          | mgN/L      | 4.00                      | 4.00                               | 6.28     | 0.92               | 57                                               | 57            | -77                                                                 | -77           | 2.94                            | --                | 20                               |
| Sulphate                                         | mg/L       | 21                        | 21                                 | 27       | 17                 | 30                                               | 30            | -20                                                                 | -20           | 128                             | --                | --                               |
| Total dissolved solids                           | mg/L       | 670                       | 670                                | 258      | 167                | -61                                              | -61           | -75                                                                 | -75           | --                              | --                | --                               |
| Dissolved Zinc                                   | mg/L       | 0.0051                    | 0.0051                             | 0.0170   | 0.0025             | 233                                              | 233           | -51                                                                 | -51           | 0.013                           | 0.5               | 0.4                              |

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

\* Used year 3 predictions for Portage and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

\*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

2013 Comparison of predicted pit water quantity and quality to the measured water quantity and quality  
MINING YEAR 4

Water Quantity Year 3^

| Pits**    | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
|-----------|----------------|---------------|--------------------------------------------|
| Portage   | 931 800        | 676 706       | -27                                        |
| Bay Goose | 1 235 100      | 344 994       | -72                                        |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project

\*\*There is no year 4 in the predicted model so take year 3 for Portage and Vault and year 3 for Goose.

Third Portage Open Pit Sumps Water Quality Year 4

| Parameters             | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                         | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile + |               | CCME<br>Guidelines** | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|------------------------|------------|------------------------------|------------------------------------------|----------|-------------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----------------------|----------------------|----------------------------------------|
|                        |            |                              |                                          | Mean     | Lower 25th<br>centile + | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor |                      |                      |                                        |
| pH                     |            | 6.30                         | 6.10                                     | 7.49     | 7.17                    | 19                                                  | 23            | 14                                                                        | 18            | 6.5 to 9.0           | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity             | mg CaCO3/L | 40                           | 43                                       | 72       | 52                      | 81                                                  | 68            | 30                                                                        | 21            | --                   | --                   | --                                     |
| Ammonia (unionized)    | mg N/L     | 0.00052                      | 0.00055                                  | 0.2000   | 0.0250                  | 38 362                                              | 36 264        | 4 708                                                                     | 4 445         | 0.016                | --                   | --                                     |
| Ammonia nitrogen       | mg N/L     | 2.1                          | 3.5                                      | 3.6      | 0.2                     | 70                                                  | 2             | -91                                                                       | -95           | 1.83                 | --                   | 16                                     |
| Dissolved Arsenic      | mg/L       | 0.0024                       | 0.068                                    | 0.0180   | -                       | 650                                                 | -74           |                                                                           |               | 0.005                | 0.5                  | 0.3                                    |
| Chloride               | mg/L       | 620                          | 630                                      | 2        | -                       | -100                                                | -100          |                                                                           |               | 120                  | --                   | 1000                                   |
| Dissolved Copper       | mg/L       | 0.0014                       | 0.016                                    | 0.0124   | -                       | 788                                                 | -22           |                                                                           |               | 0.002                | 0.3                  | 0.1                                    |
| Fluoride               | mg/L       | 0.19                         | 0.24                                     | 0.13     | -                       | -32                                                 | -46           |                                                                           |               | 0.12                 | --                   | --                                     |
| Hardness               | mg CaCO3/L | 300                          | 310                                      | 48       | -                       | -84                                                 | -85           |                                                                           |               | --                   | --                   | --                                     |
| Dissolved Lead         | mg/L       | 0.0016                       | 0.0076                                   | 0.0010   | -                       | -36                                                 | -87           |                                                                           |               | 0.001                | 0.2                  | 0.1                                    |
| Dissolved Nickel       | mg/L       | 0.003                        | 0.093                                    | 0.0047   | -                       | 62                                                  | -95           |                                                                           |               | 0.025                | 0.5                  | 0.2                                    |
| Dissolved Barium       | mg/L       | 0.041                        | 0.063                                    | 0.0076   | -                       | -82                                                 | -88           |                                                                           |               | --                   | --                   | --                                     |
| Dissolved Cadmium      | mg/L       | 0.000076                     | 0.00027                                  | 0.0000   | -                       | -87                                                 | -96           |                                                                           |               | 0.00004              | --                   | 0.002                                  |
| Dissolved Iron         | mg/L       | 0.37                         | 4.6                                      | 0.0125   | -                       | -97                                                 | -100          |                                                                           |               | 0.3                  | --                   | --                                     |
| Dissolved Mercury      | mg/L       | 0.0000059                    | 0.000054                                 | 0.00005  | -                       | 747                                                 | -7            |                                                                           |               | 0.000026             | --                   | 0.0004                                 |
| Dissolved Manganese    | mg/L       | 0.19                         | 0.66                                     | 0.0123   | -                       | -94                                                 | -98           |                                                                           |               | 0.23                 | --                   | --                                     |
| Dissolved Molybdenum   | mg/L       | 0.013                        | 0.013                                    | 0.0016   | -                       | -88                                                 | -88           |                                                                           |               | 0.073                | --                   | --                                     |
| Dissolved Selenium     | mg/L       | 0.0003                       | 0.0012                                   | 0.0005   | -                       | 72                                                  | -58           |                                                                           |               | 0.001                | --                   | --                                     |
| Dissolved Thallium     | mg/L       | 0.00003                      | 0.00012                                  | 0.0025   | -                       | 7 965                                               | 1 983         |                                                                           |               | 0.0008               | --                   | --                                     |
| Nitrate                | mgN/L      | 2.30                         | 4.0                                      | 1.35     | -                       | -41                                                 | -66           |                                                                           |               | 2.94                 | --                   | 20                                     |
| Sulphate               | mg/L       | 31                           | 46                                       | 83       | -                       | 167                                                 | 80            |                                                                           |               | 128                  | --                   | --                                     |
| Total dissolved solids | mg/L       | 960                          | 990                                      | 127      | 57                      | -87                                                 | -87           | -94                                                                       | -94           | --                   | --                   | --                                     |
| Dissolved Zinc         | mg/L       | 0.0076                       | 0.085                                    | 0.0028   | -                       | -64                                                 | -97           |                                                                           |               | 0.013                | 0.5                  | 0.4                                    |

Goose Island Open Pit Sumps Water Quality Year 3

| Parameters             | Units      | Probable Scenario<br>Year 3* | Possible Poor end<br>Scenario<br>Year 3* | Measured |                         | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile + |               | CCME<br>Guidelines** | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|------------------------|------------|------------------------------|------------------------------------------|----------|-------------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----------------------|----------------------|----------------------------------------|
|                        |            |                              |                                          | Mean     | Lower 25th<br>centile + | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor |                      |                      |                                        |
| pH                     |            | 6.10                         | 6.10                                     | 7.68     | 7.49                    | 26                                                  | 26            | 23                                                                        | 23            | 6.5 to 9.0           | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity             | mg CaCO3/L | 27                           | 27                                       | 130      | 109                     | 380                                                 | 380           | 304                                                                       | 304           | --                   | --                   | --                                     |
| Ammonia (unionized)    | mg N/L     | 0.00056                      | 0.00056                                  | 0.2961   | 0.1400                  | 52 777                                              | 52 777        | 24 900                                                                    | 24 900        | 0.016                | --                   | --                                     |
| Ammonia nitrogen       | mg N/L     | 5.4                          | 5                                        | 7.9      | 4.0                     | 46                                                  | 46            | -26                                                                       | -26           | 1.83                 | --                   | 16                                     |
| Dissolved Arsenic      | mg/L       | 0.0016                       | 0.0016                                   | 0.0046   | -                       | 188                                                 | 188           |                                                                           |               | 0.005                | 0.5                  | 0.3                                    |
| Chloride               | mg/L       | 440                          | 440                                      | 62       | -                       | -86                                                 | -86           |                                                                           |               | 120                  | --                   | 1000                                   |
| Dissolved Copper       | mg/L       | 0.001                        | 0.001                                    | 0.0712   | -                       | 7 389                                               | 7 389         |                                                                           |               | 0.002                | 0.3                  | 0.1                                    |
| Fluoride               | mg/L       | 0.13                         | 0.13                                     | 0.72     | -                       | 454                                                 | 454           |                                                                           |               | 0.12                 | --                   | --                                     |
| Hardness               | mg CaCO3/L | 210                          | 210                                      | 214      | -                       | 2                                                   | 2             |                                                                           |               | --                   | --                   | --                                     |
| Dissolved Lead         | mg/L       | 0.0011                       | 0.0011                                   | 0.0002   | -                       | -86                                                 | -86           |                                                                           |               | 0.001                | 0.2                  | 0.1                                    |
| Dissolved Nickel       | mg/L       | 0.002                        | 0.002                                    | 0.0599   | -                       | 2 893                                               | 2 893         |                                                                           |               | 0.025                | 0.5                  | 0.2                                    |
| Dissolved Barium       | mg/L       | 0.027                        | 0.0270                                   | 0.1328   | -                       | 392                                                 | 392           |                                                                           |               | --                   | --                   | --                                     |
| Dissolved Cadmium      | mg/L       | 0.000051                     | 0.000051                                 | 0.0000   | -                       | -12                                                 | -12           |                                                                           |               | 0.00004              | --                   | 0.002                                  |
| Dissolved Iron         | mg/L       | 0.25                         | 0.25                                     | 0.1025   | -                       | -59                                                 | -59           |                                                                           |               | 0.3                  | --                   | --                                     |
| Dissolved Mercury      | mg/L       | 0.0000039                    | 0.0000039                                | 0.00008  | -                       | 1 823                                               | 1 823         |                                                                           |               | 0.000026             | --                   | 0.0004                                 |
| Dissolved Manganese    | mg/L       | 0.13                         | 0.13                                     | 0.2192   | -                       | 69                                                  | 69            |                                                                           |               | 0.23                 | --                   | --                                     |
| Dissolved Molybdenum   | mg/L       | 0.0086                       | 0.0086                                   | 0.0207   | -                       | 140                                                 | 140           |                                                                           |               | 0.073                | --                   | --                                     |
| Dissolved Selenium     | mg/L       | 0.0002                       | 0.0002                                   | 0.0015   | -                       | 650                                                 | 650           |                                                                           |               | 0.001                | --                   | --                                     |
| Dissolved Thallium     | mg/L       | 0.00002                      | 0.00002                                  | 0.0025   | -                       | 12 400                                              | 12 400        |                                                                           |               | 0.0008               | --                   | --                                     |
| Nitrate                | mgN/L      | 4.00                         | 4.00                                     | 20.80    | -                       | 420                                                 | 420           |                                                                           |               | 2.94                 | --                   | 20                                     |
| Sulphate               | mg/L       | 21                           | 21                                       | 66       | -                       | 216                                                 | 216           |                                                                           |               | 128                  | --                   | --                                     |
| Total dissolved solids | mg/L       | 670                          | 670                                      | 314      | 218                     | -53                                                 | -53           | -68                                                                       | -68           | --                   | --                   | --                                     |
| Dissolved Zinc         | mg/L       | 0.0051                       | 0.0051                                   | 0.0075   | -                       | 47                                                  | 47            |                                                                           |               | 0.013                | 0.5                  | 0.4                                    |

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

\* Used year 4 predictions for Portage and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 2 or 1 samples were monitored in 2013

\*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2014 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 5**

| Water Quantity Year 5^ |                |               |                                            |
|------------------------|----------------|---------------|--------------------------------------------|
| Pits**                 | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
| Portage                | 715 200        | 165 877       | -77                                        |
| Bay Goose              | 1 235 100      | 307 769       | -75                                        |
| Vault Pit              | 46 100         | 101 617       | 120                                        |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.7  
\*\*There is no year 5 in the predicted model for Bay Goose so take year 3 for Goose.

| Vault Pit Sumps Water Quality Year 5 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|--------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                           | Units      | Probable Scenario Year 5* | Possible Poor end Scenario Year 5* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                      |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                   |            | 8.00                      | 8.00                               | 7.13     | -                   | -11                                              | -11           | -                                                                 | -             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                           | mg CaCO3/L | 0.091                     | 9.7                                | 89       | -                   | 97 153                                           | 812           | -                                                                 | -             | --                              | --                | --                                      |
| Ammonia (unionized)                  | mg N/L     | 0.78                      | 1.30                               | 0.1800   | -                   | -77                                              | -86           | -                                                                 | -             | 0.016                           | --                | --                                      |
| Ammonia nitrogen                     | mg N/L     | 64                        | 110                                | 14.4     | -                   | -78                                              | -87           | -                                                                 | -             | 1.83                            | --                | 20                                      |
| Dissolved Arsenic                    | mg/L       | 0.000063                  | 0.052                              | 0.0127   | -                   | 20 059                                           | -76           | -                                                                 | -             | 0.005                           | 0.5               | 0.1                                     |
| Chloride                             | mg/L       | 0.0031                    | 0.033                              | 31       | -                   | 996 674                                          | 93 536        | -                                                                 | -             | 120                             | --                | 500                                     |
| Dissolved Copper                     | mg/L       | 0.000063                  | 0.00075                            | 0.0116   | -                   | 184 027                                          | 1 447         | -                                                                 | -             | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                             | mg/L       | 0.000063                  | 0.013                              | 0.26     | -                   | 4 126 884                                        | 1 900         | -                                                                 | -             | 0.12                            | --                | --                                      |
| Hardness                             | mg CaCO3/L | 0.11                      | 19                                 | 378      | -                   | 343 536                                          | 1 889         | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Lead                       | mg/L       | 0.00000081                | 0.000011                           | 0.0002   | -                   | 18 419                                           | 1 264         | -                                                                 | -             | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                     | mg/L       | 0.000012                  | 0.00011                            | 0.0254   | -                   | 211 567                                          | 22 991        | -                                                                 | -             | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                     | mg/L       | 0.000210                  | 0.012                              | 0.0588   | -                   | 27 900                                           | 390           | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Cadmium                    | mg/L       | 0.000000081               | 0.000011                           | 0.0003   | -                   | 370 270                                          | 2 627         | -                                                                 | -             | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                       | mg/L       | 0.000063                  | 0.002                              | 0.2200   | -                   | 349 106                                          | 10 900        | -                                                                 | -             | 0.3                             | --                | --                                      |
| Dissolved Mercury                    | mg/L       | 0.000000081               | 0.000011                           | 0.00010  | -                   | 123 357                                          | 809           | -                                                                 | -             | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                  | mg/L       | 0.000018                  | 0.00230                            | 0.1328   | -                   | 737 678                                          | 5 674         | -                                                                 | -             | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                 | mg/L       | 0.000160                  | 0.03100                            | 0.1089   | -                   | 67 963                                           | 251           | -                                                                 | -             | 0.073                           | --                | --                                      |
| Dissolved Selenium                   | mg/L       | 0.0000041                 | 0.00055                            | 0.0070   | -                   | 170 632                                          | 1 173         | -                                                                 | -             | 0.001                           | --                | --                                      |
| Dissolved Thallium                   | mg/L       | 0.0000021                 | 0.000023                           | 0.0025   | -                   | 118 948                                          | 10 770        | -                                                                 | -             | 0.0008                          | --                | --                                      |
| Nitrate                              | mgN/L      | 71                        | 120                                | 46.40    | -                   | -35                                              | -61           | -                                                                 | -             | 2.94                            | --                | 50                                      |
| Sulphate                             | mg/L       | 0.01                      | 10                                 | 148      | -                   | 1 479 900                                        | 1 380         | -                                                                 | -             | 128                             | --                | --                                      |
| Total dissolved solids               | mg/L       | 150                       | 300                                | 456      | -                   | 204                                              | 52            | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Zinc                       | mg/L       | 0.000041                  | 0.00052                            | 0.0020   | -                   | 4 778                                            | 285           | -                                                                 | -             | 0.013                           | 0.5               | 0.2                                     |

| Goose Island Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                  | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                             |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                          |            | 6.10                      | 6.10                               | 7.97     | 7.52               | 31                                               | 31            | 23                                                                  | 23            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                  | mg CaCO3/L | 27                        | 27                                 | 90       | 86                 | 233                                              | 233           | 217                                                                 | 217           | --                              | --                | --                               |
| Ammonia (unionized)                         | mg N/L     | 0.00056                   | 0.00056                            | 0.0600   | 0.0100             | 10 614                                           | 10 614        | 1 686                                                               | 1 686         | 0.016                           | --                | --                               |
| Ammonia nitrogen                            | mg N/L     | 5.4                       | 5                                  | 1.8      | 0.2                | -66                                              | -66           | -96                                                                 | -96           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                           | mg/L       | 0.0016                    | 0.0016                             | 0.0040   | -                  | 150                                              | 150           | -                                                                   | -             | 0.005                           | 0.5               | 0.3                              |
| Chloride                                    | mg/L       | 440                       | 440                                | 53       | -                  | -88                                              | -88           | -                                                                   | -             | 120                             | --                | 1000                             |
| Dissolved Copper                            | mg/L       | 0.001                     | 0.001                              | 0.0010   | -                  | 5                                                | 5             | -                                                                   | -             | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                    | mg/L       | 0.13                      | 0.13                               | 0.94     | -                  | 623                                              | 623           | -                                                                   | -             | 0.12                            | --                | --                               |
| Hardness                                    | mg CaCO3/L | 210                       | 210                                | 131      | -                  | -38                                              | -38           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Lead                              | mg/L       | 0.0011                    | 0.0011                             | 0.0002   | -                  | -82                                              | -82           | -                                                                   | -             | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                            | mg/L       | 0.002                     | 0.002                              | 0.0150   | -                  | 650                                              | 650           | -                                                                   | -             | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                            | mg/L       | 0.027                     | 0.0270                             | 0.0280   | -                  | 4                                                | 4             | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Cadmium                           | mg/L       | 0.000051                  | 0.000051                           | 0.0000   | -                  | -80                                              | -80           | -                                                                   | -             | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                              | mg/L       | 0.25                      | 0.25                               | 0.0050   | -                  | -98                                              | -98           | -                                                                   | -             | 0.3                             | --                | --                               |
| Dissolved Mercury                           | mg/L       | 0.0000039                 | 0.0000039                          | 0.00010  | -                  | 2 464                                            | 2 464         | -                                                                   | -             | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                         | mg/L       | 0.13                      | 0.13                               | 0.0590   | -                  | -55                                              | -55           | -                                                                   | -             | 0.23                            | --                | --                               |
| Dissolved Molybdenum                        | mg/L       | 0.0086                    | 0.0086                             | 0.0180   | -                  | 109                                              | 109           | -                                                                   | -             | 0.073                           | --                | --                               |
| Dissolved Selenium                          | mg/L       | 0.0002                    | 0.0002                             | 0.0010   | -                  | 400                                              | 400           | -                                                                   | -             | 0.001                           | --                | --                               |
| Dissolved Thallium                          | mg/L       | 0.00002                   | 0.00002                            | 0.0030   | -                  | 14 900                                           | 14 900        | -                                                                   | -             | 0.0008                          | --                | --                               |
| Nitrate                                     | mgN/L      | 4.00                      | 4.00                               | 10.90    | -                  | 173                                              | 173           | -                                                                   | -             | 2.94                            | --                | 20                               |
| Sulphate                                    | mg/L       | 21                        | 21                                 | 61       | -                  | 190                                              | 190           | -                                                                   | -             | 128                             | --                | --                               |
| Total dissolved solids                      | mg/L       | 670                       | 670                                | 530      | 232                | -21                                              | -21           | -65                                                                 | -65           | --                              | --                | --                               |
| Dissolved Zinc                              | mg/L       | 0.0051                    | 0.0051                             | 0.0010   | -                  | -80                                              | -80           | -                                                                   | -             | 0.013                           | 0.5               | 0.4                              |

**Footnotes:**

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

\* Used year 5 predictions for Vault and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 2 or 1 samples were monitored in 2014

\*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2015 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 6**

| Water Quantity - Year 5^ |                |               |                                            |
|--------------------------|----------------|---------------|--------------------------------------------|
| Pits**                   | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
| Portage                  | 715 200        | 136 627       | -81                                        |
| Bay Goose                | 1 086 400      | 383 800       | -65                                        |
| Vault Pit                | 46 100         | 111 336       | 142                                        |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.7

\*\*There is no year 6 in the predicted model so take year 5 for Portage and Vault. For Goose, pit reflooding started in 2015, use year 5 reflooding values minus evaporation for Goose.

| Vault Pit Sumps Water Quality Year 6 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|--------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                           | Units      | Probable Scenario Year 6* | Possible Poor end Scenario Year 6* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                      |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                   |            | 8.00                      | 8.00                               | 7.11     | -                   | -11                                              | -11           | -                                                                 | -             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                           | mg CaCO3/L | 0.160                     | 17                                 | 126      | -                   | 78 650                                           | 641           | -                                                                 | -             | --                              | --                | --                                      |
| Ammonia (unionized)                  | mg N/L     | 0.55                      | 0.92                               | 0.3200   | -                   | -42                                              | -65           | -                                                                 | -             | 0.016                           | --                | --                                      |
| Ammonia nitrogen                     | mg N/L     | 45                        | 76                                 | 22.6     | -                   | -50                                              | -70           | -                                                                 | -             | 1.83                            | --                | 20                                      |
| Dissolved Asenic                     | mg/L       | 0.00011                   | 0.089                              | 0.0003   | -                   | 127                                              | -100          | -                                                                 | -             | 0.005                           | 0.5               | 0.1                                     |
| Chloride                             | mg/L       | 0.0054                    | 0.057                              | 33       | -                   | 614 715                                          | 58 146        | -                                                                 | -             | 120                             | --                | 500                                     |
| Dissolved Copper                     | mg/L       | 0.0000110                 | 0.00130                            | 0.0010   | -                   | 8 991                                            | -23           | -                                                                 | -             | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                             | mg/L       | 0.0000110                 | 0.022                              | 0.25     | -                   | 2 272 627                                        | 1 036         | -                                                                 | -             | 0.12                            | --                | --                                      |
| Hardness                             | mg CaCO3/L | 0.20                      | 32                                 | 340      | -                   | 169 900                                          | 963           | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Lead                       | mg/L       | 0.00000140                | 0.000019                           | 0.0002   | -                   | 10 614                                           | 689           | -                                                                 | -             | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                     | mg/L       | 0.000021                  | 0.00019                            | 0.0218   | -                   | 103 710                                          | 11 374        | -                                                                 | -             | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                     | mg/L       | 0.000039                  | 0.020                              | 0.0703   | -                   | 180 156                                          | 252           | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Cadmium                    | mg/L       | 0.0000014                 | 0.000019                           | 0.0000   | -                   | 614                                              | -47           | -                                                                 | -             | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                       | mg/L       | 0.000110                  | 0.004                              | 0.5900   | -                   | 536 264                                          | 16 757        | -                                                                 | -             | 0.3                             | --                | --                                      |
| Dissolved Mercury                    | mg/L       | 0.000000140               | 0.000019                           | 0.00001  | -                   | 3 471                                            | -74           | -                                                                 | -             | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                  | mg/L       | 0.000030                  | 0.00390                            | 0.0863   | -                   | 287 567                                          | 2 113         | -                                                                 | -             | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                 | mg/L       | 0.000280                  | 0.05300                            | 0.1111   | -                   | 39 579                                           | 110           | -                                                                 | -             | 0.073                           | --                | --                                      |
| Dissolved Selenium                   | mg/L       | 0.0000069                 | 0.00094                            | 0.0040   | -                   | 57 871                                           | 326           | -                                                                 | -             | 0.001                           | --                | --                                      |
| Dissolved Thallium                   | mg/L       | 0.0000036                 | 0.000039                           | 0.0025   | -                   | 69 344                                           | 6 310         | -                                                                 | -             | 0.0008                          | --                | --                                      |
| Nitrate                              | mgN/L      | 50                        | 86                                 | 45.90    | -                   | -8                                               | -47           | -                                                                 | -             | 2.94                            | --                | 50                                      |
| Sulphate                             | mg/L       | 0.02                      | 17                                 | 124      | -                   | 729 312                                          | 629           | -                                                                 | -             | 128                             | --                | --                                      |
| Total dissolved solids               | mg/L       | 100                       | 240                                | 568      | -                   | 468                                              | 137           | -                                                                 | -             | --                              | --                | --                                      |
| Dissolved Zinc                       | mg/L       | 0.000069                  | 0.00089                            | 0.0005   | -                   | 625                                              | -44           | -                                                                 | -             | 0.013                           | 0.5               | 0.2                                     |

| Goose Island Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                  | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                             |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                          |            | 6.10                      | 6.10                               | 7.37     | 7.06               | 21                                               | 21            | 16                                                                  | 16            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                  | mg CaCO3/L | 27                        | 27                                 | 57       | 52                 | 109                                              | 109           | 91                                                                  | 91            | --                              | --                | --                               |
| Ammonia (unionized)                         | mg N/L     | 0.00056                   | 0.00056                            | 0.0138   | 0.0088             | 2 355                                            | 2 355         | 1 463                                                               | 1 463         | 0.016                           | --                | --                               |
| Ammonia nitrogen                            | mg N/L     | 5.4                       | 5                                  | 1.1      | 0.8                | -79                                              | -79           | -84                                                                 | -84           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                           | mg/L       | 0.0016                    | 0.0016                             | 0.0003   | 0.0003             | -84                                              | -84           | -84                                                                 | -84           | 0.005                           | 0.5               | 0.3                              |
| Chloride                                    | mg/L       | 440                       | 440                                | 22       | 16                 | -95                                              | -95           | -96                                                                 | -96           | 120                             | --                | 1000                             |
| Dissolved Copper                            | mg/L       | 0.001                     | 0.001                              | 0.0013   | 0.0006             | 35                                               | 35            | -34                                                                 | -34           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                    | mg/L       | 0.13                      | 0.13                               | 0.40     | 0.36               | 205                                              | 205           | 173                                                                 | 173           | 0.12                            | --                | --                               |
| Hardness                                    | mg CaCO3/L | 210                       | 210                                | 134      | 116                | -36                                              | -36           | -45                                                                 | -45           | --                              | --                | --                               |
| Dissolved Lead                              | mg/L       | 0.0011                    | 0.0011                             | 0.0002   | 0.0002             | -82                                              | -82           | -86                                                                 | -86           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                            | mg/L       | 0.002                     | 0.002                              | 0.0326   | 0.0232             | 1 532                                            | 1 532         | 1 060                                                               | 1 060         | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                            | mg/L       | 0.027                     | 0.0270                             | 0.0173   | 0.0151             | -36                                              | -36           | -44                                                                 | -44           | --                              | --                | --                               |
| Dissolved Cadmium                           | mg/L       | 0.000051                  | 0.000051                           | 0.0000   | 0.0000             | -74                                              | -74           | -80                                                                 | -80           | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                              | mg/L       | 0.25                      | 0.25                               | 0.0050   | 0.0050             | -98                                              | -98           | -98                                                                 | -98           | 0.3                             | --                | --                               |
| Dissolved Mercury                           | mg/L       | 0.0000039                 | 0.0000039                          | 0.00001  | 0.00001            | 156                                              | 156           | 28                                                                  | 28            | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                         | mg/L       | 0.13                      | 0.13                               | 0.1776   | 0.1642             | 37                                               | 37            | 26                                                                  | 26            | 0.23                            | --                | --                               |
| Dissolved Molybdenum                        | mg/L       | 0.0086                    | 0.0086                             | 0.0099   | 0.0089             | 16                                               | 16            | 3                                                                   | 3             | 0.073                           | --                | --                               |
| Dissolved Selenium                          | mg/L       | 0.0002                    | 0.0002                             | 0.0015   | 0.0013             | 650                                              | 650           | 525                                                                 | 525           | 0.001                           | --                | --                               |
| Dissolved Thallium                          | mg/L       | 0.00002                   | 0.00002                            | 0.0025   | 0.0025             | 12 400                                           | 12 400        | 12 400                                                              | 12 400        | 0.0008                          | --                | --                               |
| Nitrate                                     | mgN/L      | 4.00                      | 4.00                               | 2.96     | 2.50               | -26                                              | -26           | -38                                                                 | -38           | 2.94                            | --                | 20                               |
| Sulphate                                    | mg/L       | 21                        | 21                                 | 79       | 60                 | 276                                              | 276           | 185                                                                 | 185           | 128                             | --                | --                               |
| Total dissolved solids                      | mg/L       | 670                       | 670                                | 180      | 114                | -73                                              | -73           | -83                                                                 | -83           | --                              | --                | --                               |
| Dissolved Zinc                              | mg/L       | 0.0051                    | 0.0051                             | 0.0005   | 0.0005             | -90                                              | -90           | -90                                                                 | -90           | 0.013                           | 0.5               | 0.4                              |

| Third Portage Pit Sumps Water Quality Year 4 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|----------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                   | Units      | Probable Scenario Year 4* | Possible Poor end Scenario Year 4* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                              |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                           |            | 6.30                      | 6.10                               | 6.66     | 6.36               | 6                                                | 9             | 1                                                                   | 4             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                   | mg CaCO3/L | 40                        | 43                                 | 64       | 60                 | 59                                               | 48            | 49                                                                  | 38            | --                              | --                | --                               |
| Ammonia (unionized)                          | mg N/L     | 0.00052                   | 0.00055                            | 0.0467   | 0.0250             | 8 874                                            | 8 385         | 4 708                                                               | 4 445         | 0.016                           | --                | --                               |
| Ammonia nitrogen                             | mg N/L     | 2.1                       | 4                                  | 2.8      | 2.2                | 31                                               | -21           | 5                                                                   | -37           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                            | mg/L       | 0.0024                    | 0.0680                             | 0.0160   | -                  | 567                                              | -76           | -                                                                   | -             | 0.005                           | 0.5               | 0.3                              |
| Chloride                                     | mg/L       | 620                       | 630                                | 15       | -                  | -98                                              | -98           | -                                                                   | -             | 120                             | --                | 1000                             |
| Dissolved Copper                             | mg/L       | 0.0014                    | 0.016                              | 0.0003   | -                  | -82                                              | -98           | -                                                                   | -             | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                     | mg/L       | 0.19                      | 0.24                               | 0.27     | -                  | 39                                               | 10            | -                                                                   | -             | 0.12                            | --                | --                               |
| Hardness                                     | mg CaCO3/L | 300                       | 310                                | 196      | -                  | -35                                              | -37           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Lead                               | mg/L       | 0.0016                    | 0.0076                             | 0.0002   | -                  | -91                                              | -98           | -                                                                   | -             | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                             | mg/L       | 0.003                     | 0.093                              | 0.0323   | -                  | 1 012                                            | -65           | -                                                                   | -             | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                             | mg/L       | 0.041                     | 0.0630                             | 0.0111   | -                  | -73                                              | -82           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Cadmium                            | mg/L       | 0.000076                  | 0.00027                            | 0.0000   | -                  | -87                                              | -96           | -                                                                   | -             | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                               | mg/L       | 0.37                      | 4.60                               | 0.0050   | -                  | -99                                              | -100          | -                                                                   | -             | 0.3                             | --                | --                               |
| Dissolved Mercury                            | mg/L       | 0.0000059                 | 0.0000540                          | 0.00001  | -                  | 112                                              | -77           | -                                                                   | -             | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                          | mg/L       | 0.19                      | 0.66                               | 0.0921   | -                  | -52                                              | -86           | -                                                                   | -             | 0.23                            | --                | --                               |
| Dissolved Molybdenum                         | mg/L       | 0.013                     | 0.013                              | 0.0628   | -                  | 383                                              | 383           | -                                                                   | -             | 0.073                           | --                | --                               |
| Dissolved Selenium                           | mg/L       | 0.0003                    | 0.0012                             | 0.0015   | -                  | 417                                              | 25            | -                                                                   | -             | 0.001                           | --                | --                               |
| Dissolved Thallium                           | mg/L       | 0.00003                   | 0.00012                            | 0.0025   | -                  | 7 965                                            | 1 983         | -                                                                   | -             | 0.0008                          | --                | --                               |
| Nitrate                                      | mgN/L      | 2.30                      | 4.00                               | 10.47    | -                  | 355                                              | 162           | -                                                                   | -             | 2.94                            | --                | 20                               |
| Sulphate                                     | mg/L       | 31                        | 46                                 | 136      | -                  | 337                                              | 195           | -                                                                   | -             | 128                             | --                | --                               |
| Total dissolved solids                       | mg/L       | 960                       | 990                                | 498      | 363                | -48                                              | -50           | -62                                                                 | -63           | --                              | --                | --                               |
| Dissolved Zinc                               | mg/L       | 0.0076                    | 0.0850                             | 0.0005   | -                  | -93                                              | -99           | -                                                                   | -             | 0.013                           | 0.5               | 0.4                              |

| North Portage Pit Sumps Water Quality Year 4 |            |                              |                                          |          |                       |                                                     |               |                                                                           |               |                      |                      |                                        |
|----------------------------------------------|------------|------------------------------|------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----------------------|----------------------|----------------------------------------|
| Parameters                                   | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile * |               | CCME<br>Guidelines** | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|                                              |            |                              |                                          | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor |                      |                      |                                        |
| pH                                           |            | 6.30                         | 6.10                                     | 7.87     | 7.45                  | 25                                                  | 29            | 18                                                                        | 22            | 6.5 to 9.0           | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity                                   | mg CaCO3/L | 0.05                         | 2.4                                      | 77       | 68                    | 153 614                                             | 3 102         | 134 900                                                                   | 2 713         | --                   | --                   | --                                     |
| Ammonia (unionized)                          | mg N/L     | 0.003                        | 0.0014                                   | 0.0557   | 0.0350                | 1 757                                               | 3 880         | 1 067                                                                     | 2 400         | 0.016                | --                   | --                                     |
| Ammonia nitrogen                             | mg N/L     | 12                           | 8.9                                      | 2.9      | 1.8                   | -76                                                 | -67           | -85                                                                       | -80           | 1.83                 | --                   | 16                                     |
| Dissolved Arsenic                            | mg/L       | 0.00005                      | 0.056                                    | 0.0205   | -                     | 45 344                                              | -63           | -                                                                         | -             | 0.005                | 0.5                  | 0.3                                    |
| Chloride                                     | mg/L       | 0.0010                       | 0.25                                     | 17       | 12                    | 1 757 553                                           | 6 790         | 1 247 349                                                                 | 4 790         | 120                  | --                   | 1000                                   |
| Dissolved Copper                             | mg/L       | 0.00001                      | 0.007                                    | 0.0007   | -                     | 6 036                                               | -90           | -                                                                         | -             | 0.002                | 0.3                  | 0.1                                    |
| Fluoride                                     | mg/L       | 0.000008                     | 0.031                                    | 0.31     | 0.29                  | 3 812 400                                           | 884           | 3 656 150                                                                 | 844           | 0.12                 | --                   | --                                     |
| Hardness                                     | mg CaCO3/L | 0.05                         | 8                                        | 239      | 191                   | 530 456                                             | 2 884         | 423 789                                                                   | 2 284         | --                   | --                   | --                                     |
| Dissolved Lead                               | mg/L       | 0.000002                     | 0.0029                                   | 0.0002   | -                     | 10 127                                              | -92           | -                                                                         | -             | 0.001                | 0.2                  | 0.1                                    |
| Dissolved Nickel                             | mg/L       | 0.00003                      | 0.043                                    | 0.0071   | -                     | 20 782                                              | -83           | -                                                                         | -             | 0.025                | 0.5                  | 0.2                                    |
| Dissolved Barium                             | mg/L       | 0.00002                      | 0.013                                    | 0.0092   | -                     | 48 058                                              | -30           | -                                                                         | -             | --                   | --                   | --                                     |
| Dissolved Cadmium                            | mg/L       | 0.0000006                    | 0.000099                                 | 0.0000   | -                     | 1 567                                               | -90           | -                                                                         | -             | 0.00004              | --                   | 0.002                                  |
| Dissolved Iron                               | mg/L       | 0.000097                     | 2.1                                      | 0.0075   | -                     | 7 632                                               | -100          | -                                                                         | -             | 0.3                  | --                   | --                                     |
| Dissolved Mercury                            | mg/L       | 0.000000056                  | 0.000029                                 | 0.00001  | -                     | 8 829                                               | -83           | -                                                                         | -             | 0.000026             | --                   | 0.0004                                 |
| Dissolved Manganese                          | mg/L       | 0.0002                       | 0.22                                     | 0.0706   | -                     | 46 967                                              | -68           | -                                                                         | -             | 0.23                 | --                   | --                                     |
| Dissolved Molybdenum                         | mg/L       | 0.000004                     | 0.00081                                  | 0.0182   | -                     | 454 900                                             | 2 147         | -                                                                         | -             | 0.073                | --                   | --                                     |
| Dissolved Selenium                           | mg/L       | 0.000003                     | 0.00058                                  | 0.0010   | -                     | 33 233                                              | 72            | -                                                                         | -             | 0.001                | --                   | --                                     |
| Dissolved Thallium                           | mg/L       | 0.0000014                    | 0.000057                                 | 0.0038   | -                     | 267 757                                             | 6 479         | -                                                                         | -             | 0.0008               | --                   | --                                     |
| Nitrate                                      | mgN/L      | 13                           | 10.00                                    | 11.90    | 9.72                  | -8                                                  | 19            | -25                                                                       | -3            | 2.94                 | --                   | 20                                     |
| Sulphate                                     | mg/L       | 0.011                        | 8.8                                      | 179      | 135                   | 1 630 809                                           | 1 939         | 1 226 264                                                                 | 1 433         | 128                  | --                   | --                                     |
| Total dissolved solids                       | mg/L       | 28                           | 41                                       | 399      | 309                   | 1 326                                               | 874           | 1 004                                                                     | 654           | --                   | --                   | --                                     |
| Dissolved Zinc                               | mg/L       | 0.000032                     | 0.037                                    | 0.0008   | -                     | 2 244                                               | -98           | -                                                                         | -             | 0.013                | 0.5                  | 0.4                                    |

**Footnotes:**  
 Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.  
 \* Used year 6 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0  
 + Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2015.  
 \*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).  
 Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2016 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 7**

| Water Quantity - Year 7^ |                |               |                                            |
|--------------------------|----------------|---------------|--------------------------------------------|
| Pits**                   | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
| Portage                  | 715 200        | 132 359       | -81                                        |
| Bay Goose                | 800 100        | 375 300       | -53                                        |
| Vault Pit                | 55 600         | 54 964        | -1                                         |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.8

\*\*For year 7, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 7 reflooding values minus evaporation for Goose.

| Vault Pit Sumps Water Quality Year 7 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|--------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                           | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                      |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                   |            | 8.00                      | 8.00                               | 7.76     | 7.56                | -3                                               | -3            | -6                                                                | -6            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                           | mg CaCO3/L | 0.220                     | 23                                 | 95       | 87                  | 42 968                                           | 312           | 39 445                                                            | 278           | --                              | --                | --                                      |
| Ammonia (unionized)                  | mg N/L     | 0.40                      | 0.67                               | 0.113    | 0.110               | -72                                              | -83           | -73                                                               | -84           | 0.016                           | --                | --                                      |
| Ammonia nitrogen                     | mg N/L     | 33                        | 55                                 | 5.0      | 3.7                 | -85                                              | -91           | -89                                                               | -93           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic                    | mg/L       | 0.00015                   | 0.120                              | 0.0023   | 0.0003              | 1 400                                            | -98           | 67                                                                | -100          | 0.005                           | 0.5               | 0.1                                     |
| Chloride                             | mg/L       | 0.0075                    | 0.079                              | 29       | 17                  | 390 900                                          | 37 020        | 223 567                                                           | 21 134        | 120                             | --                | 500                                     |
| Dissolved Copper                     | mg/L       | 0.000150                  | 0.00180                            | 0.0023   | 0.0005              | 15 483                                           | 30            | 3 317                                                             | -72           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                             | mg/L       | 0.0000150                 | 0.031                              | 0.19     | 0.19                | 1 266 567                                        | 513           | 1 233 233                                                         | 497           | 0.12                            | --                | --                                      |
| Hardness                             | mg CaCO3/L | 0.27                      | 45                                 | 332      | 258                 | 122 956                                          | 638           | 95 270                                                            | 472           | --                              | --                | --                                      |
| Dissolved Lead                       | mg/L       | 0.00000190                | 0.000027                           | 0.0002   | 0.0002              | 7 795                                            | 456           | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                     | mg/L       | 0.000030                  | 0.00027                            | 0.0065   | 0.0024              | 21 692                                           | 2 321         | 7 858                                                             | 784           | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                     | mg/L       | 0.000054                  | 0.028                              | 0.0306   | 0.0193              | 56 474                                           | 9             | 35 641                                                            | -31           | --                              | --                | --                                      |
| Dissolved Cadmium                    | mg/L       | 0.0000019                 | 0.000027                           | 0.0001   | 0.0001              | 6 742                                            | 381           | 3 979                                                             | 187           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                       | mg/L       | 0.000150                  | 0.005                              | 0.0350   | 0.0250              | 23 233                                           | 629           | 16 567                                                            | 421           | 0.3                             | --                | --                                      |
| Dissolved Mercury                    | mg/L       | 0.000000190               | 0.000027                           | 0.000018 | 0.00001             | 9 111                                            | -35           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                  | mg/L       | 0.000042                  | 0.00540                            | 0.1398   | 0.0952              | 332 757                                          | 2 489         | 226 567                                                           | 1 663         | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                 | mg/L       | 0.000390                  | 0.07300                            | 0.0659   | 0.0533              | 16 785                                           | -10           | 13 560                                                            | -27           | 0.073                           | --                | --                                      |
| Dissolved Selenium                   | mg/L       | 0.0000097                 | 0.00130                            | 0.0039   | 0.0024              | 39 848                                           | 198           | 24 385                                                            | 83            | 0.001                           | --                | --                                      |
| Dissolved Thallium                   | mg/L       | 0.0000050                 | 0.000054                           | 0.0006   | 0.0004              | 10 900                                           | 919           | 7 900                                                             | 641           | 0.0008                          | --                | --                                      |
| Nitrate                              | mgN/L      | 36                        | 62                                 | 19.85    | 9.83                | -45                                              | -68           | -73                                                               | -84           | 2.94                            | --                | 50                                      |
| Sulphate                             | mg/L       | 0.02                      | 24                                 | 144      | 143                 | 599 796                                          | 500           | 595 629                                                           | 496           | 128                             | --                | --                                      |
| Total dissolved solids               | mg/L       | 76                        | 210                                | 529      | 441                 | 596                                              | 152           | 480                                                               | 110           | --                              | --                | --                                      |
| Dissolved Zinc                       | mg/L       | 0.000097                  | 0.00120                            | 0.0008   | 0.0005              | 673                                              | -38           | 415                                                               | -58           | 0.013                           | 0.5               | 0.2                                     |

| Goose Island Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                  | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                             |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                          |            | 6.10                      | 6.10                               | 7.73     | 7.63               | 27                                               | 27            | 25                                                                  | 25            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                  | mg CaCO3/L | 27                        | 27                                 | 47       | 45                 | 74                                               | 74            | 66                                                                  | 66            | --                              | --                | --                               |
| Ammonia (unionized)                         | mg N/L     | 0.00056                   | 0.00056                            | 0.0050   | 0.0050             | 793                                              | 793           | 793                                                                 | 793           | 0.016                           | --                | --                               |
| Ammonia nitrogen                            | mg N/L     | 5.4                       | 5                                  | 0.1      | 0.0                | -98                                              | -98           | -99                                                                 | -99           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                           | mg/L       | 0.0016                    | 0.0016                             | 0.0003   | 0.0003             | -84                                              | -84           | -84                                                                 | -84           | 0.005                           | 0.5               | 0.3                              |
| Chloride                                    | mg/L       | 440                       | 440                                | 13       | 12                 | -97                                              | -97           | -97                                                                 | -97           | 120                             | --                | 1000                             |
| Dissolved Copper                            | mg/L       | 0.001                     | 0.001                              | 0.0009   | 0.0004             | -7                                               | -7            | -54                                                                 | -54           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                    | mg/L       | 0.13                      | 0.13                               | 0.34     | 0.33               | 163                                              | 163           | 154                                                                 | 154           | 0.12                            | --                | --                               |
| Hardness                                    | mg CaCO3/L | 210                       | 210                                | 127      | 113                | -40                                              | -40           | -46                                                                 | -46           | --                              | --                | --                               |
| Dissolved Lead                              | mg/L       | 0.0011                    | 0.0011                             | 0.0002   | 0.0002             | -86                                              | -86           | -86                                                                 | -86           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                            | mg/L       | 0.002                     | 0.002                              | 0.0352   | 0.0260             | 1 660                                            | 1 660         | 1 201                                                               | 1 201         | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                            | mg/L       | 0.027                     | 0.0270                             | 0.0162   | 0.0142             | -40                                              | -40           | -48                                                                 | -48           | --                              | --                | --                               |
| Dissolved Cadmium                           | mg/L       | 0.000051                  | 0.000051                           | 0.0000   | 0.0000             | -75                                              | -75           | -80                                                                 | -80           | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                              | mg/L       | 0.25                      | 0.25                               | 0.0050   | 0.0050             | -98                                              | -98           | -98                                                                 | -98           | 0.3                             | --                | --                               |
| Dissolved Mercury                           | mg/L       | 0.0000039                 | 0.0000039                          | 0.00001  | 0.00001            | 60                                               | 60            | 28                                                                  | 28            | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                         | mg/L       | 0.13                      | 0.13                               | 0.0480   | 0.0244             | -63                                              | -63           | -81                                                                 | -81           | 0.23                            | --                | --                               |
| Dissolved Molybdenum                        | mg/L       | 0.0086                    | 0.0086                             | 0.0064   | 0.0060             | -25                                              | -25           | -30                                                                 | -30           | 0.073                           | --                | --                               |
| Dissolved Selenium                          | mg/L       | 0.0002                    | 0.0002                             | 0.0008   | 0.0005             | 275                                              | 275           | 150                                                                 | 150           | 0.001                           | --                | --                               |
| Dissolved Thallium                          | mg/L       | 0.00002                   | 0.00002                            | 0.0006   | 0.0004             | 2 650                                            | 2 650         | 1 900                                                               | 1 900         | 0.0008                          | --                | --                               |
| Nitrate                                     | mgN/L      | 4.00                      | 4.00                               | 3.72     | 3.55               | -7                                               | -7            | -11                                                                 | -11           | 2.94                            | --                | 20                               |
| Sulphate                                    | mg/L       | 21                        | 21                                 | 84       | 80                 | 301                                              | 301           | 279                                                                 | 279           | 128                             | --                | --                               |
| Total dissolved solids                      | mg/L       | 670                       | 670                                | 238      | 229                | -64                                              | -64           | -66                                                                 | -66           | --                              | --                | --                               |
| Dissolved Zinc                              | mg/L       | 0.0051                    | 0.0051                             | 0.0005   | 0.0005             | -90                                              | -90           | -90                                                                 | -90           | 0.013                           | 0.5               | 0.4                              |

| Third Portage Pit Sumps Water Quality Year 4 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|----------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                   | Units      | Probable Scenario Year 4* | Possible Poor end Scenario Year 4* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                              |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                           |            | 6.30                      | 6.10                               | 7.70     | -                  | 22                                               | 26            | -                                                                   | -             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                   | mg CaCO3/L | 40                        | 43                                 | 64       | 54                 | 59                                               | 48            | 34                                                                  | 24            | --                              | --                | --                               |
| Ammonia (unionized)                          | mg N/L     | 0.00052                   | 0.00055                            | 0.0833   | 0.0300             | 15 926                                           | 15 052        | 5 669                                                               | 5 355         | 0.016                           | --                | --                               |
| Ammonia nitrogen                             | mg N/L     | 2.1                       | 4                                  | 5.3      | 4.4                | 153                                              | 52            | 108                                                                 | 25            | 1.83                            | --                | 16                               |
| Dissolved Arsenic                            | mg/L       | 0.0024                    | 0.0680                             | 0.0003   | -                  | -90                                              | -100          | -                                                                   | -             | 0.005                           | 0.5               | 0.3                              |
| Chloride                                     | mg/L       | 620                       | 630                                | 31       | 29                 | -95                                              | -95           | -95                                                                 | -95           | 120                             | --                | 1000                             |
| Dissolved Copper                             | mg/L       | 0.0014                    | 0.016                              | 0.0010   | -                  | -29                                              | -94           | -                                                                   | -             | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                     | mg/L       | 0.19                      | 0.24                               | 0.51     | 0.42               | 167                                              | 111           | 118                                                                 | 73            | 0.12                            | --                | --                               |
| Hardness                                     | mg CaCO3/L | 300                       | 310                                | 273      | 199                | -9                                               | -12           | -34                                                                 | -36           | --                              | --                | --                               |
| Dissolved Lead                               | mg/L       | 0.0016                    | 0.0076                             | 0.0002   | -                  | -91                                              | -98           | -                                                                   | -             | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                             | mg/L       | 0.003                     | 0.093                              | 0.0072   | -                  | 148                                              | -92           | -                                                                   | -             | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                             | mg/L       | 0.041                     | 0.0630                             | 0.0173   | -                  | -58                                              | -73           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Cadmium                            | mg/L       | 0.000076                  | 0.00027                            | 0.0002   | -                  | 216                                              | -11           | -                                                                   | -             | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                               | mg/L       | 0.37                      | 4.60                               | 0.0200   | -                  | -95                                              | -100          | -                                                                   | -             | 0.3                             | --                | --                               |
| Dissolved Mercury                            | mg/L       | 0.0000059                 | 0.0000540                          | 0.00005  | -                  | 747                                              | -7            | -                                                                   | -             | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                          | mg/L       | 0.19                      | 0.66                               | 0.5854   | -                  | 208                                              | -11           | -                                                                   | -             | 0.23                            | --                | --                               |
| Dissolved Molybdenum                         | mg/L       | 0.013                     | 0.013                              | 0.0867   | -                  | 567                                              | 567           | -                                                                   | -             | 0.073                           | --                | --                               |
| Dissolved Selenium                           | mg/L       | 0.0003                    | 0.0012                             | 0.0020   | -                  | 590                                              | 67            | -                                                                   | -             | 0.001                           | --                | --                               |
| Dissolved Thallium                           | mg/L       | 0.00003                   | 0.00012                            | 0.0004   | -                  | 1 190                                            | 233           | -                                                                   | -             | 0.0008                          | --                | --                               |
| Nitrate                                      | mgN/L      | 2.30                      | 4.00                               | 4.34     | 1.62               | 89                                               | 9             | -30                                                                 | -60           | 2.94                            | --                | 20                               |
| Sulphate                                     | mg/L       | 31                        | 46                                 | 245      | 153                | 691                                              | 433           | 394                                                                 | 233           | 128                             | --                | --                               |
| Total dissolved solids                       | mg/L       | 960                       | 990                                | 562      | 470                | -41                                              | -43           | -51                                                                 | -53           | --                              | --                | --                               |
| Dissolved Zinc                               | mg/L       | 0.0076                    | 0.0850                             | 0.0040   | -                  | -47                                              | -95           | -                                                                   | -             | 0.013                           | 0.5               | 0.4                              |

| North Portage Pit Sumps Water Quality Year 4 |            |                              |                                          |          |                       |                                                     |               |                                                                           |               |                      |                      |                                        |
|----------------------------------------------|------------|------------------------------|------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----------------------|----------------------|----------------------------------------|
| Parameters                                   | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile * |               | CCME<br>Guidelines** | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|                                              |            |                              |                                          | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor |                      |                      |                                        |
| pH                                           |            | 6.30                         | 6.10                                     | 7.91     | 7.92                  | 26                                                  | 30            | 26                                                                        | 30            | 6.5 to 9.0           | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity                                   | mg CaCO3/L | 0.05                         | 2.4                                      | 97       | 79                    | 194 186                                             | 3 948         | 157 900                                                                   | 3 192         | --                   | --                   | --                                     |
| Ammonia (unionized)                          | mg N/L     | 0.003                        | 0.0014                                   | 0.0914   | 0.0600                | 2 948                                               | 6 431         | 1 900                                                                     | 4 186         | 0.016                | --                   | --                                     |
| Ammonia nitrogen                             | mg N/L     | 12                           | 8.9                                      | 3.7      | 2.8                   | -69                                                 | -58           | -77                                                                       | -69           | 1.83                 | --                   | 16                                     |
| Dissolved Asenic                             | mg/L       | 0.00005                      | 0.056                                    | 0.0140   | 0.0061                | 30 928                                              | -75           | 13 372                                                                    | -89           | 0.005                | 0.5                  | 0.3                                    |
| Chloride                                     | mg/L       | 0.0010                       | 0.25                                     | 24       | 19                    | 2 415 352                                           | 9 369         | 1 918 267                                                                 | 7 420         | 120                  | --                   | 1000                                   |
| Dissolved Copper                             | mg/L       | 0.00001                      | 0.007                                    | 0.0013   | 0.0007                | 11 264                                              | -82           | 6 036                                                                     | -90           | 0.002                | 0.3                  | 0.1                                    |
| Fluoride                                     | mg/L       | 0.000008                     | 0.031                                    | 0.43     | 0.35                  | 5 357 043                                           | 1 282         | 4 312 400                                                                 | 1 013         | 0.12                 | --                   | --                                     |
| Hardness                                     | mg CaCO3/L | 0.05                         | 8                                        | 306      | 236                   | 679 583                                             | 3 723         | 524 344                                                                   | 2 850         | --                   | --                   | --                                     |
| Dissolved Lead                               | mg/L       | 0.000002                     | 0.0029                                   | 0.0002   | 0.0002                | 6 718                                               | -95           | 6 718                                                                     | -95           | 0.001                | 0.2                  | 0.1                                    |
| Dissolved Nickel                             | mg/L       | 0.00003                      | 0.043                                    | 0.0325   | 0.0253                | 95 488                                              | -24           | 74 165                                                                    | -41           | 0.025                | 0.5                  | 0.2                                    |
| Dissolved Barium                             | mg/L       | 0.00002                      | 0.013                                    | 0.0207   | 0.0150                | 108 979                                             | 59            | 78 847                                                                    | 15            | --                   | --                   | --                                     |
| Dissolved Cadmium                            | mg/L       | 0.000006                     | 0.000099                                 | 0.0004   | 0.0002                | 61 150                                              | 271           | 32 400                                                                    | 97            | 0.00004              | --                   | 0.002                                  |
| Dissolved Iron                               | mg/L       | 0.000097                     | 2.1                                      | 0.0063   | 0.0050                | 6 343                                               | -100          | 5 055                                                                     | -100          | 0.3                  | --                   | --                                     |
| Dissolved Mercury                            | mg/L       | 0.000000056                  | 0.000029                                 | 0.00002  | 0.00001               | 33 382                                              | -35           | 8 829                                                                     | -83           | 0.000026             | --                   | 0.0004                                 |
| Dissolved Manganese                          | mg/L       | 0.0002                       | 0.22                                     | 0.1373   | 0.1225                | 91 433                                              | -38           | 81 533                                                                    | -44           | 0.23                 | --                   | --                                     |
| Dissolved Molybdenum                         | mg/L       | 0.000004                     | 0.00081                                  | 0.1319   | 0.1192                | 3 296 775                                           | 16 181        | 2 979 275                                                                 | 14 613        | 0.073                | --                   | --                                     |
| Dissolved Selenium                           | mg/L       | 0.000003                     | 0.00058                                  | 0.0020   | 0.0010                | 66 567                                              | 245           | 33 233                                                                    | 72            | 0.001                | --                   | --                                     |
| Dissolved Thallium                           | mg/L       | 0.0000014                    | 0.000057                                 | 0.0004   | 0.0004                | 28 471                                              | 602           | 28 471                                                                    | 602           | 0.0008               | --                   | --                                     |
| Nitrate                                      | mgN/L      | 13                           | 10.00                                    | 12.68    | 12.60                 | -2                                                  | 27            | -3                                                                        | 26            | 2.94                 | --                   | 20                                     |
| Sulphate                                     | mg/L       | 0.011                        | 8.8                                      | 232      | 195                   | 2 107 692                                           | 2 535         | 1 772 627                                                                 | 2 116         | 128                  | --                   | --                                     |
| Total dissolved solids                       | mg/L       | 28                           | 41                                       | 518      | 455                   | 1 752                                               | 1 164         | 1 523                                                                     | 1 009         | --                   | --                   | --                                     |
| Dissolved Zinc                               | mg/L       | 0.000032                     | 0.037                                    | 0.0021   | 0.0009                | 6 541                                               | -94           | 2 634                                                                     | -98           | 0.013                | 0.5                  | 0.4                                    |

**Footnotes:**  
 Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.  
 \* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0  
 + Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2016.  
 \*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).  
 Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2017 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 8**

| Water Quantity - Year 8^ |                |               |                                            |
|--------------------------|----------------|---------------|--------------------------------------------|
| Pits**                   | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
| Portage                  | 715 200        | 341 192       | -52                                        |
| Bay Goose                | 635 200        | 464 019       | -27                                        |
| Vault Pit                | 53 900         | 249 513       | 363                                        |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.9

\*\*For year 8, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 8 reflooding values minus evaporation for Goose.

| Vault Pit Sumps Water Quality Year 7 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|--------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                           | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                      |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                   |            | 8.00                      | 8.00                               | 7.72     | 7.44                | -4                                               | -4            | -7                                                                | -7            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                           | mg CaCO3/L | 0.220                     | 23                                 | 120      | 110                 | 54 218                                           | 420           | 50 014                                                            | 379           | --                              | --                | --                                      |
| Ammonia (unionized)                  | mg N/L     | 0.40                      | 0.67                               | 0.083    | 0.070               | -79                                              | -88           | -83                                                               | -90           | 0.016                           | --                | --                                      |
| Ammonia nitrogen                     | mg N/L     | 33                        | 55                                 | 3.8      | 3.5                 | -88                                              | -93           | -89                                                               | -94           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic                    | mg/L       | 0.00015                   | 0.120                              | 0.0046   | 0.0003              | 2 950                                            | -96           | 67                                                                | -100          | 0.005                           | 0.5               | 0.1                                     |
| Chloride                             | mg/L       | 0.0075                    | 0.079                              | 36       | 26                  | 474 344                                          | 44 942        | 344 900                                                           | 32 653        | 120                             | --                | 500                                     |
| Dissolved Copper                     | mg/L       | 0.0000150                 | 0.00180                            | 0.0013   | 0.0003              | 8 400                                            | -29           | 1 567                                                             | -86           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                             | mg/L       | 0.0000150                 | 0.031                              | 0.19     | 0.17                | 1 244 344                                        | 502           | 1 099 900                                                         | 432           | 0.12                            | --                | --                                      |
| Hardness                             | mg CaCO3/L | 0.27                      | 45                                 | 290      | 249                 | 107 246                                          | 544           | 91 937                                                            | 452           | --                              | --                | --                                      |
| Dissolved Lead                       | mg/L       | 0.00000190                | 0.000027                           | 0.0005   | 0.0002              | 24 900                                           | 1 659         | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                     | mg/L       | 0.000030                  | 0.00027                            | 0.0077   | 0.0033              | 25 428                                           | 2 736         | 10 733                                                            | 1 104         | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                     | mg/L       | 0.000054                  | 0.028                              | 0.0271   | 0.0213              | 50 162                                           | -3            | 39 391                                                            | -24           | --                              | --                | --                                      |
| Dissolved Cadmium                    | mg/L       | 0.0000019                 | 0.000027                           | 0.0000   | 0.0000              | 1 918                                            | 42            | 426                                                               | -63           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                       | mg/L       | 0.000150                  | 0.005                              | 0.6200   | 0.0113              | 413 233                                          | 12 817        | 7 400                                                             | 134           | 0.3                             | --                | --                                      |
| Dissolved Mercury                    | mg/L       | 0.000000190               | 0.000027                           | 0.00002  | 0.00001             | 7 795                                            | -44           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                  | mg/L       | 0.000042                  | 0.00540                            | 0.2675   | 0.1847              | 636 805                                          | 4 854         | 439 662                                                           | 3 320         | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                 | mg/L       | 0.000390                  | 0.07300                            | 0.0283   | 0.0144              | 7 159                                            | -61           | 3 579                                                             | -80           | 0.073                           | --                | --                                      |
| Dissolved Selenium                   | mg/L       | 0.0000097                 | 0.00130                            | 0.0016   | 0.0013              | 16 223                                           | 22            | 12 787                                                            | -4            | 0.001                           | --                | --                                      |
| Dissolved Thallium                   | mg/L       | 0.0000050                 | 0.000054                           | 0.0004   | 0.0004              | 7 900                                            | 641           | 7 900                                                             | 641           | 0.0008                          | --                | --                                      |
| Nitrate                              | mgN/L      | 36                        | 62                                 | 4.23     | 1.28                | -88                                              | -93           | -96                                                               | -98           | 2.94                            | --                | 50                                      |
| Sulphate                             | mg/L       | 0.02                      | 24                                 | 146      | 76                  | 609 761                                          | 510           | 315 004                                                           | 215           | 128                             | --                | --                                      |
| Total dissolved solids               | mg/L       | 76                        | 210                                | 464      | 411                 | 511                                              | 121           | 441                                                               | 96            | --                              | --                | --                                      |
| Dissolved Zinc                       | mg/L       | 0.000097                  | 0.00120                            | 0.0008   | 0.0005              | 759                                              | -31           | 415                                                               | -58           | 0.013                           | 0.5               | 0.2                                     |

| Goose Island Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                  | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                             |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                          |            | 6.10                      | 6.10                               | 7.92     | 7.81               | 30                                               | 30            | 28                                                                  | 28            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                  | mg CaCO3/L | 27                        | 27                                 | 86       | 83                 | 217                                              | 217           | 207                                                                 | 207           | --                              | --                | --                               |
| Ammonia (unionized)                         | mg N/L     | 0.00056                   | 0.00056                            | 0.0183   | 0.0125             | 3 174                                            | 3 174         | 2 132                                                               | 2 132         | 0.016                           | --                | --                               |
| Ammonia nitrogen                            | mg N/L     | 5.4                       | 5                                  | 1.2      | 1.0                | -79                                              | -79           | -82                                                                 | -82           | 1.83                            | --                | 16                               |
| Dissolved Arsenic                           | mg/L       | 0.0016                    | 0.0016                             | 0.0003   | 0.0003             | -84                                              | -84           | -84                                                                 | -84           | 0.005                           | 0.5               | 0.3                              |
| Chloride                                    | mg/L       | 440                       | 440                                | 13       | 12                 | -97                                              | -97           | -97                                                                 | -97           | 120                             | --                | 1000                             |
| Dissolved Copper                            | mg/L       | 0.001                     | 0.001                              | 0.0009   | 0.0007             | -9                                               | -9            | -26                                                                 | -26           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                    | mg/L       | 0.13                      | 0.13                               | 0.18     | 0.17               | 41                                               | 41            | 27                                                                  | 27            | 0.12                            | --                | --                               |
| Hardness                                    | mg CaCO3/L | 210                       | 210                                | 226      | 208                | 8                                                | 8             | -1                                                                  | -1            | --                              | --                | --                               |
| Dissolved Lead                              | mg/L       | 0.0011                    | 0.0011                             | 0.0002   | 0.0002             | -86                                              | -86           | -86                                                                 | -86           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                            | mg/L       | 0.002                     | 0.002                              | 0.0702   | 0.0638             | 3 410                                            | 3 410         | 3 088                                                               | 3 088         | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                            | mg/L       | 0.027                     | 0.0270                             | 0.0378   | 0.0341             | 40                                               | 40            | 26                                                                  | 26            | --                              | --                | --                               |
| Dissolved Cadmium                           | mg/L       | 0.000051                  | 0.000051                           | 0.0000   | 0.0000             | -80                                              | -80           | -80                                                                 | -80           | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                              | mg/L       | 0.25                      | 0.25                               | 0.0050   | 0.0050             | -98                                              | -98           | -98                                                                 | -98           | 0.3                             | --                | --                               |
| Dissolved Mercury                           | mg/L       | 0.0000039                 | 0.0000039                          | 0.00002  | 0.00001            | 285                                              | 285           | 92                                                                  | 92            | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                         | mg/L       | 0.13                      | 0.13                               | 0.0842   | 0.0788             | -35                                              | -35           | -39                                                                 | -39           | 0.23                            | --                | --                               |
| Dissolved Molybdenum                        | mg/L       | 0.0086                    | 0.0086                             | 0.0070   | 0.0065             | -19                                              | -19           | -24                                                                 | -24           | 0.073                           | --                | --                               |
| Dissolved Selenium                          | mg/L       | 0.0002                    | 0.0002                             | 0.0015   | 0.0013             | 650                                              | 650           | 525                                                                 | 525           | 0.001                           | --                | --                               |
| Dissolved Thallium                          | mg/L       | 0.00002                   | 0.00002                            | 0.0004   | 0.0004             | 1 900                                            | 1 900         | 1 900                                                               | 1 900         | 0.0008                          | --                | --                               |
| Nitrate                                     | mgN/L      | 4.00                      | 4.00                               | 13.22    | 9.68               | 230                                              | 230           | 142                                                                 | 142           | 2.94                            | --                | 20                               |
| Sulphate                                    | mg/L       | 21                        | 21                                 | 147      | 134                | 602                                              | 602           | 538                                                                 | 538           | 128                             | --                | --                               |
| Total dissolved solids                      | mg/L       | 670                       | 670                                | 423      | 406                | -37                                              | -37           | -39                                                                 | -39           | --                              | --                | --                               |
| Dissolved Zinc                              | mg/L       | 0.0051                    | 0.0051                             | 0.0018   | 0.0008             | -64                                              | -64           | -85                                                                 | -85           | 0.013                           | 0.5               | 0.4                              |

| Third Portage Pit Sumps Water Quality Year 4 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|----------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                   | Units      | Probable Scenario Year 4* | Possible Poor end Scenario Year 4* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                              |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                           |            | 6.30                      | 6.10                               | 8.14     | 8.05               | 29                                               | 33            | 28                                                                  | 32            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                   | mg CaCO3/L | 40                        | 43                                 | 77       | 74                 | 92                                               | 78            | 85                                                                  | 72            | --                              | --                | --                               |
| Ammonia (unionized)                          | mg N/L     | 0.00052                   | 0.00055                            | 0.0617   | 0.0425             | 11 759                                           | 11 112        | 8 073                                                               | 7 627         | 0.016                           | --                | --                               |
| Ammonia nitrogen                             | mg N/L     | 2.1                       | 4                                  | 4.2      | 3.7                | 100                                              | 20            | 76                                                                  | 6             | 1.83                            | --                | 16                               |
| Dissolved Arsenic                            | mg/L       | 0.0024                    | 0.0680                             | 0.0003   | 0.0003             | -90                                              | -100          | -90                                                                 | -100          | 0.005                           | 0.5               | 0.3                              |
| Chloride                                     | mg/L       | 620                       | 630                                | 29       | 28                 | -95                                              | -95           | -95                                                                 | -96           | 120                             | --                | 1000                             |
| Dissolved Copper                             | mg/L       | 0.0014                    | 0.016                              | 0.0004   | 0.0003             | -74                                              | -98           | -82                                                                 | -98           | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                     | mg/L       | 0.19                      | 0.24                               | 0.39     | 0.38               | 104                                              | 61            | 97                                                                  | 56            | 0.12                            | --                | --                               |
| Hardness                                     | mg CaCO3/L | 300                       | 310                                | 192      | 179                | -36                                              | -38           | -40                                                                 | -42           | --                              | --                | --                               |
| Dissolved Lead                               | mg/L       | 0.0016                    | 0.0076                             | 0.0002   | 0.0002             | -91                                              | -98           | -91                                                                 | -98           | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                             | mg/L       | 0.003                     | 0.093                              | 0.0175   | 0.0137             | 503                                              | -81           | 372                                                                 | -85           | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                             | mg/L       | 0.041                     | 0.0630                             | 0.0101   | 0.0090             | -75                                              | -84           | -78                                                                 | -86           | --                              | --                | --                               |
| Dissolved Cadmium                            | mg/L       | 0.000076                  | 0.00027                            | 0.0000   | 0.0000             | -61                                              | -89           | -87                                                                 | -96           | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                               | mg/L       | 0.37                      | 4.60                               | 0.0050   | 0.0050             | -99                                              | -100          | -99                                                                 | -100          | 0.3                             | --                | --                               |
| Dissolved Mercury                            | mg/L       | 0.0000059                 | 0.0000540                          | 0.00004  | 0.00004            | 634                                              | -20           | 493                                                                 | -35           | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                          | mg/L       | 0.19                      | 0.66                               | 0.0735   | 0.0577             | -61                                              | -89           | -70                                                                 | -91           | 0.23                            | --                | --                               |
| Dissolved Molybdenum                         | mg/L       | 0.013                     | 0.013                              | 0.0279   | 0.0271             | 115                                              | 115           | 108                                                                 | 108           | 0.073                           | --                | --                               |
| Dissolved Selenium                           | mg/L       | 0.0003                    | 0.0012                             | 0.0017   | 0.0010             | 475                                              | 39            | 245                                                                 | -17           | 0.001                           | --                | --                               |
| Dissolved Thallium                           | mg/L       | 0.00003                   | 0.00012                            | 0.0004   | 0.0004             | 1 190                                            | 233           | 1 190                                                               | 233           | 0.0008                          | --                | --                               |
| Nitrate                                      | mgN/L      | 2.30                      | 4.00                               | 7.56     | 5.50               | 229                                              | 89            | 139                                                                 | 37            | 2.94                            | --                | 20                               |
| Sulphate                                     | mg/L       | 31                        | 46                                 | 129      | 124                | 316                                              | 180           | 298                                                                 | 168           | 128                             | --                | --                               |
| Total dissolved solids                       | mg/L       | 960                       | 990                                | 388      | 376                | -60                                              | -61           | -61                                                                 | -62           | --                              | --                | --                               |
| Dissolved Zinc                               | mg/L       | 0.0076                    | 0.0850                             | 0.0005   | 0.0005             | -93                                              | -99           | -93                                                                 | -99           | 0.013                           | 0.5               | 0.4                              |

| North Portage Pit Sumps Water Quality Year 4 |            |                              |                                          |          |                       |                                                     |               |                                                                           |               |                      |                      |                                        |
|----------------------------------------------|------------|------------------------------|------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----------------------|----------------------|----------------------------------------|
| Parameters                                   | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile * |               | CCME<br>Guidelines** | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|                                              |            |                              |                                          | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor |                      |                      |                                        |
| pH                                           |            | 6.30                         | 6.10                                     | 7.85     | 7.61                  | 25                                                  | 29            | 21                                                                        | 25            | 6.5 to 9.0           | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity                                   | mg CaCO3/L | 0.05                         | 2.4                                      | 98       | 81                    | 196 700                                             | 4 000         | 161 900                                                                   | 3 275         | --                   | --                   | --                                     |
| Ammonia (unionized)                          | mg N/L     | 0.003                        | 0.0014                                   | 0.0717   | 0.0100                | 2 289                                               | 5 019         | 233                                                                       | 614           | 0.016                | --                   | --                                     |
| Ammonia nitrogen                             | mg N/L     | 12                           | 8.9                                      | 2.6      | 0.7                   | -78                                                 | -71           | -94                                                                       | -92           | 1.83                 | --                   | 16                                     |
| Dissolved Asenic                             | mg/L       | 0.00005                      | 0.056                                    | 0.0203   | 0.0118                | 44 937                                              | -64           | 26 011                                                                    | -79           | 0.005                | 0.5                  | 0.3                                    |
| Chloride                                     | mg/L       | 0.0010                       | 0.25                                     | 25       | 16                    | 2 553 641                                           | 9 911         | 1 601 941                                                                 | 6 180         | 120                  | --                   | 1000                                   |
| Dissolved Copper                             | mg/L       | 0.00001                      | 0.007                                    | 0.0016   | 0.0003                | 14 021                                              | -78           | 2 173                                                                     | -96           | 0.002                | 0.3                  | 0.1                                    |
| Fluoride                                     | mg/L       | 0.000008                     | 0.031                                    | 0.42     | 0.38                  | 5 250 733                                           | 1 255         | 4 749 900                                                                 | 1 126         | 0.12                 | --                   | --                                     |
| Hardness                                     | mg CaCO3/L | 0.05                         | 8                                        | 214      | 201                   | 476 048                                             | 2 578         | 446 567                                                                   | 2 413         | --                   | --                   | --                                     |
| Dissolved Lead                               | mg/L       | 0.000002                     | 0.0029                                   | 0.0009   | 0.0002                | 40 506                                              | -69           | 6 718                                                                     | -95           | 0.001                | 0.2                  | 0.1                                    |
| Dissolved Nickel                             | mg/L       | 0.00003                      | 0.043                                    | 0.0290   | 0.0251                | 85 214                                              | -33           | 73 724                                                                    | -42           | 0.025                | 0.5                  | 0.2                                    |
| Dissolved Barium                             | mg/L       | 0.00002                      | 0.013                                    | 0.0159   | 0.0130                | 83 689                                              | 22            | 68 058                                                                    | 0             | --                   | --                   | --                                     |
| Dissolved Cadmium                            | mg/L       | 0.0000006                    | 0.000099                                 | 0.0001   | 0.0000                | 13 178                                              | -20           | 1 567                                                                     | -90           | 0.00004              | --                   | 0.002                                  |
| Dissolved Iron                               | mg/L       | 0.000097                     | 2.1                                      | 0.0200   | 0.0050                | 20 519                                              | -99           | 5 055                                                                     | -100          | 0.3                  | --                   | --                                     |
| Dissolved Mercury                            | mg/L       | 0.000000056                  | 0.000029                                 | 0.00002  | 0.00001               | 37 995                                              | -26           | 8 829                                                                     | -83           | 0.000026             | --                   | 0.0004                                 |
| Dissolved Manganese                          | mg/L       | 0.0002                       | 0.22                                     | 0.1255   | 0.1112                | 83 589                                              | -43           | 74 000                                                                    | -49           | 0.23                 | --                   | --                                     |
| Dissolved Molybdenum                         | mg/L       | 0.000004                     | 0.00081                                  | 0.0592   | 0.0405                | 1 479 567                                           | 7 207         | 1 011 150                                                                 | 4 894         | 0.073                | --                   | --                                     |
| Dissolved Selenium                           | mg/L       | 0.000003                     | 0.00058                                  | 0.0009   | 0.0005                | 30 567                                              | 59            | 16 567                                                                    | -14           | 0.001                | --                   | --                                     |
| Dissolved Thallium                           | mg/L       | 0.0000014                    | 0.000057                                 | 0.0004   | 0.0004                | 28 471                                              | 602           | 28 471                                                                    | 602           | 0.0008               | --                   | --                                     |
| Nitrate                                      | mgN/L      | 13                           | 10.00                                    | 8.81     | 6.19                  | -32                                                 | -12           | -52                                                                       | -38           | 2.94                 | --                   | 20                                     |
| Sulphate                                     | mg/L       | 0.011                        | 8.8                                      | 186      | 159                   | 1 690 809                                           | 2 014         | 1 445 355                                                                 | 1 707         | 128                  | --                   | --                                     |
| Total dissolved solids                       | mg/L       | 28                           | 41                                       | 463      | 396                   | 1 555                                               | 1 030         | 1 314                                                                     | 866           | --                   | --                   | --                                     |
| Dissolved Zinc                               | mg/L       | 0.000032                     | 0.037                                    | 0.0006   | 0.0005                | 1 619                                               | -99           | 1 463                                                                     | -99           | 0.013                | 0.5                  | 0.4                                    |

**Footnotes:**  
 Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.  
 \* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0  
 + Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2016.  
 \*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).  
 Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2018 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 9**

| Water Quantity - Year 9^ |                |               |                                            |
|--------------------------|----------------|---------------|--------------------------------------------|
| Pits**                   | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
| Portage                  | 715 200        | 117 803       | -84                                        |
| Bay Goose                | 635 200        | 327 114       | -49                                        |
| Vault Pit                | 53 900         | 88 469        | 64                                         |

^predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.4 and 12-6

\*\*For year 9, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 8 reflooding values minus evaporation for Goose. For Vault, use

| Vault Pit Sumps Water Quality Year 7 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|--------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                           | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                      |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                   |            | 8.00                      | 8.00                               | 7.52     | 7.34                | -6                                               | -6            | -8                                                                | -8            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                           | mg CaCO3/L | 0.220                     | 23                                 | 107      | 100                 | 48 536                                           | 365           | 45 355                                                            | 335           | --                              | --                | --                                      |
| Ammonia (unionized)                  | mg N/L     | 0.40                      | 0.67                               | 0.0700   | 0.0600              | -83                                              | -90           | -85                                                               | -91           | 0.016                           | --                | --                                      |
| Ammonia nitrogen                     | mg N/L     | 33                        | 55                                 | 3.1      | 2.6                 | -91                                              | -94           | -92                                                               | -95           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic                    | mg/L       | 0.00015                   | 0.120                              | 0.0022   | 0.0003              | 1 393                                            | -98           | 67                                                                | -100          | 0.005                           | 0.5               | 0.1                                     |
| Chloride                             | mg/L       | 0.0075                    | 0.079                              | 25       | 19                  | 336 967                                          | 31 900        | 258 567                                                           | 24 457        | 120                             | --                | 500                                     |
| Dissolved Copper                     | mg/L       | 0.0000150                 | 0.00180                            | 0.0014   | 0.0005              | 9 367                                            | -21           | 3 233                                                             | -72           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                             | mg/L       | 0.0000150                 | 0.031                              | 0.20     | 0.20                | 1 349 900                                        | 553           | 1 316 567                                                         | 537           | 0.12                            | --                | --                                      |
| Hardness                             | mg CaCO3/L | 0.27                      | 45                                 | 287      | 176                 | 106 122                                          | 537           | 65 085                                                            | 291           | --                              | --                | --                                      |
| Dissolved Lead                       | mg/L       | 0.00000190                | 0.000027                           | 0.0002   | 0.0002              | 9 374                                            | 567           | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                     | mg/L       | 0.000030                  | 0.00027                            | 0.0055   | 0.0044              | 18 300                                           | 1 944         | 14 567                                                            | 1 530         | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                     | mg/L       | 0.000054                  | 0.028                              | 0.0252   | 0.0184              | 46 567                                           | -10           | 33 974                                                            | -34           | --                              | --                | --                                      |
| Dissolved Cadmium                    | mg/L       | 0.0000019                 | 0.000027                           | 0.0002   | 0.0000              | 8 426                                            | 500           | 1 479                                                             | 11            | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                       | mg/L       | 0.000150                  | 0.005                              | 0.0130   | 0.0100              | 8 567                                            | 171           | 6 567                                                             | 108           | 0.3                             | --                | --                                      |
| Dissolved Mercury                    | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 2 532                                            | -81           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                  | mg/L       | 0.000042                  | 0.00540                            | 0.1330   | 0.0722              | 316 471                                          | 2 362         | 171 805                                                           | 1 237         | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                 | mg/L       | 0.000390                  | 0.07300                            | 0.0602   | 0.0480              | 15 331                                           | -18           | 12 208                                                            | -34           | 0.073                           | --                | --                                      |
| Dissolved Selenium                   | mg/L       | 0.0000097                 | 0.00130                            | 0.0009   | 0.0005              | 9 488                                            | -28           | 5 055                                                             | -62           | 0.001                           | --                | --                                      |
| Dissolved Thallium                   | mg/L       | 0.0000050                 | 0.000054                           | 0.0002   | 0.0001              | 4 300                                            | 307           | 1 900                                                             | 85            | 0.0008                          | --                | --                                      |
| Nitrate                              | mgN/L      | 36                        | 62                                 | 4.95     | 4.29                | -86                                              | -92           | -88                                                               | -93           | 2.94                            | --                | 50                                      |
| Sulphate                             | mg/L       | 0.02                      | 24                                 | 183      | 101                 | 764 400                                          | 665           | 420 733                                                           | 321           | 128                             | --                | --                                      |
| Total dissolved solids               | mg/L       | 76                        | 210                                | 370      | 283                 | 387                                              | 76            | 272                                                               | 35            | --                              | --                | --                                      |
| Dissolved Zinc                       | mg/L       | 0.000097                  | 0.00120                            | 0.0008   | 0.0005              | 725                                              | -33           | 415                                                               | -58           | 0.013                           | 0.5               | 0.2                                     |

| Phaser Pit Sumps Water Quality Year 7 |            |                           |                                    |          |                     |                                                  |               |                                                                   |               |                                 |                   |                                         |
|---------------------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
| Parameters                            | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|                                       |            |                           |                                    | Mean     | Lower 25th centile+ | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                                    |            | 8.00                      | 8.00                               | 7.76     | 7.67                | -3                                               | -3            | -4                                                                | -4            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity                            | mg CaCO3/L | 0.220                     | 23                                 | 97       | 84                  | 44 067                                           | 322           | 37 855                                                            | 263           | --                              | --                | --                                      |
| Ammonia (unionized)                   | mg N/L     | 0.40                      | 0.67                               | 0.1433   | 0.0400              | -64                                              | -79           | -90                                                               | -94           | 0.016                           | --                | --                                      |
| Ammonia nitrogen                      | mg N/L     | 33                        | 55                                 | 8.0      | 2.9                 | -76                                              | -86           | -91                                                               | -95           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic                     | mg/L       | 0.00015                   | 0.120                              | 0.0014   | 0.0003              | 817                                              | -99           | 67                                                                | -100          | 0.005                           | 0.5               | 0.1                                     |
| Chloride                              | mg/L       | 0.0075                    | 0.079                              | 8        | 6                   | 105 011                                          | 9 879         | 75 567                                                            | 7 084         | 120                             | --                | 500                                     |
| Dissolved Copper                      | mg/L       | 0.0000150                 | 0.00180                            | 0.0088   | 0.0055              | 58 678                                           | 390           | 36 733                                                            | 207           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride                              | mg/L       | 0.0000150                 | 0.031                              | 0.18     | 0.16                | 1 177 678                                        | 470           | 1 066 567                                                         | 416           | 0.12                            | --                | --                                      |
| Hardness                              | mg CaCO3/L | 0.27                      | 45                                 | 250      | 197                 | 92 369                                           | 455           | 72 956                                                            | 338           | --                              | --                | --                                      |
| Dissolved Lead                        | mg/L       | 0.00000190                | 0.000027                           | 0.0003   | 0.0002              | 14 374                                           | 919           | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel                      | mg/L       | 0.000030                  | 0.00027                            | 0.0097   | 0.0057              | 32 344                                           | 3 505         | 18 900                                                            | 2 011         | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium                      | mg/L       | 0.000054                  | 0.028                              | 0.0811   | 0.0595              | 149 993                                          | 189           | 110 085                                                           | 113           | --                              | --                | --                                      |
| Dissolved Cadmium                     | mg/L       | 0.0000019                 | 0.000027                           | 0.0001   | 0.0000              | 2 707                                            | 98            | 558                                                               | -54           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron                        | mg/L       | 0.000150                  | 0.005                              | 0.0433   | 0.0050              | 28 789                                           | 803           | 3 233                                                             | 4             | 0.3                             | --                | --                                      |
| Dissolved Mercury                     | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 2 532                                            | -81           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese                   | mg/L       | 0.000042                  | 0.00540                            | 0.1932   | 0.0833              | 459 781                                          | 3 477         | 198 174                                                           | 1 442         | 0.23                            | --                | --                                      |
| Dissolved Molybdenum                  | mg/L       | 0.000390                  | 0.07300                            | 0.0178   | 0.0089              | 4 464                                            | -76           | 2 169                                                             | -88           | 0.073                           | --                | --                                      |
| Dissolved Selenium                    | mg/L       | 0.0000097                 | 0.00130                            | 0.0006   | 0.0003              | 5 742                                            | -56           | 3 122                                                             | -76           | 0.001                           | --                | --                                      |
| Dissolved Thallium                    | mg/L       | 0.0000050                 | 0.000054                           | 0.0001   | 0.0001              | 1 900                                            | 85            | 1 900                                                             | 85            | 0.0008                          | --                | --                                      |
| Nitrate                               | mgN/L      | 36                        | 62                                 | 15.83    | 6.44                | -56                                              | -74           | -82                                                               | -90           | 2.94                            | --                | 50                                      |
| Sulphate                              | mg/L       | 0.02                      | 24                                 | 131      | 84                  | 545 733                                          | 446           | 348 442                                                           | 249           | 128                             | --                | --                                      |
| Total dissolved solids                | mg/L       | 76                        | 210                                | 344      | 276                 | 352                                              | 64            | 263                                                               | 31            | --                              | --                | --                                      |
| Dissolved Zinc                        | mg/L       | 0.000097                  | 0.00120                            | 0.0037   | 0.0014              | 3 680                                            | 206           | 1 318                                                             | 15            | 0.013                           | 0.5               | 0.2                                     |

| Goose Island Pit Sumps Water Quality Year 3 |            |                           |                                    |          |                    |                                                  |               |                                                                     |               |                                 |                   |                                  |
|---------------------------------------------|------------|---------------------------|------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|---------------------------------|-------------------|----------------------------------|
| Parameters                                  | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile + |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|                                             |            |                           |                                    | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                                          |            | 6.10                      | 6.10                               | 7.42     | -                  | 22                                               | 22            | -                                                                   | -             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity                                  | mg CaCO3/L | 27                        | 27                                 | 49       | -                  | 81                                               | 81            | -                                                                   | -             | --                              | --                | --                               |
| Ammonia (unionized)                         | mg N/L     | 0.00056                   | 0.00056                            | 0.0050   | -                  | 793                                              | 793           | -                                                                   | -             | 0.016                           | --                | --                               |
| Ammonia nitrogen                            | mg N/L     | 5.4                       | 5                                  | 0.1      | -                  | -98                                              | -98           | -                                                                   | -             | 1.83                            | --                | 16                               |
| Dissolved Arsenic                           | mg/L       | 0.0016                    | 0.0016                             | 0.0005   | -                  | -67                                              | -67           | -                                                                   | -             | 0.005                           | 0.5               | 0.3                              |
| Chloride                                    | mg/L       | 440                       | 440                                | 9        | -                  | -98                                              | -98           | -                                                                   | -             | 120                             | --                | 1000                             |
| Dissolved Copper                            | mg/L       | 0.001                     | 0.001                              | 0.0015   | -                  | 53                                               | 53            | -                                                                   | -             | 0.002                           | 0.3               | 0.1                              |
| Fluoride                                    | mg/L       | 0.13                      | 0.13                               | 0.23     | -                  | 77                                               | 77            | -                                                                   | -             | 0.12                            | --                | --                               |
| Hardness                                    | mg CaCO3/L | 210                       | 210                                | 172      | -                  | -18                                              | -18           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Lead                              | mg/L       | 0.0011                    | 0.0011                             | 0.0007   | -                  | -39                                              | -39           | -                                                                   | -             | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel                            | mg/L       | 0.002                     | 0.002                              | 0.1100   | -                  | 5 398                                            | 5 398         | -                                                                   | -             | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium                            | mg/L       | 0.027                     | 0.0270                             | 0.0295   | -                  | 9                                                | 9             | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Cadmium                           | mg/L       | 0.000051                  | 0.000051                           | 0.0001   | -                  | 18                                               | 18            | -                                                                   | -             | 0.00004                         | --                | 0.002                            |
| Dissolved Iron                              | mg/L       | 0.25                      | 0.25                               | 0.0050   | -                  | -98                                              | -98           | -                                                                   | -             | 0.3                             | --                | --                               |
| Dissolved Mercury                           | mg/L       | 0.0000039                 | 0.0000039                          | 0.00001  | -                  | 28                                               | 28            | -                                                                   | -             | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese                         | mg/L       | 0.13                      | 0.13                               | 0.1245   | -                  | -4                                               | -4            | -                                                                   | -             | 0.23                            | --                | --                               |
| Dissolved Molybdenum                        | mg/L       | 0.0086                    | 0.0086                             | 0.0062   | -                  | -28                                              | -28           | -                                                                   | -             | 0.073                           | --                | --                               |
| Dissolved Selenium                          | mg/L       | 0.0002                    | 0.0002                             | 0.0025   | -                  | 1 150                                            | 1 150         | -                                                                   | -             | 0.001                           | --                | --                               |
| Dissolved Thallium                          | mg/L       | 0.00002                   | 0.00002                            | 0.0001   | -                  | 400                                              | 400           | -                                                                   | -             | 0.0008                          | --                | --                               |
| Nitrate                                     | mgN/L      | 4.00                      | 4.00                               | 6.82     | -                  | 70                                               | 70            | -                                                                   | -             | 2.94                            | --                | 20                               |
| Sulphate                                    | mg/L       | 21                        | 21                                 | 142      | -                  | 574                                              | 574           | -                                                                   | -             | 128                             | --                | --                               |
| Total dissolved solids                      | mg/L       | 670                       | 670                                | 273      | -                  | -59                                              | -59           | -                                                                   | -             | --                              | --                | --                               |
| Dissolved Zinc                              | mg/L       | 0.0051                    | 0.0051                             | 0.0005   | -                  | -90                                              | -90           | -                                                                   | -             | 0.013                           | 0.5               | 0.4                              |

Third Portage Pit Sumps Water Quality Year 4

| Parameters             | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile + |               | CCME<br>Guidelines**                  | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|------------------------|------------|------------------------------|------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|---------------------------------------|----------------------|----------------------------------------|
|                        |            |                              |                                          | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor | Long Term,<br>Based on 3PL<br>quality | Max. Monthly<br>Mean | Max. Avg<br>Conc.                      |
| pH                     |            | 6.30                         | 6.10                                     | 7.67     | -                     | 22                                                  | 26            | -                                                                         | -             | 6.5 to 9.0                            | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity             | mg CaCO3/L | 40                           | 43                                       | 55       | -                     | 38                                                  | 28            | -                                                                         | -             | --                                    | --                   | --                                     |
| Ammonia (unionized)    | mg N/L     | 0.00052                      | 0.00055                                  | 0.0400   | -                     | 7 592                                               | 7 173         | -                                                                         | -             | 0.016                                 | --                   | --                                     |
| Ammonia nitrogen       | mg N/L     | 2.1                          | 4                                        | 2.1      | -                     | -1                                                  | -41           | -                                                                         | -             | 1.83                                  | --                   | 16                                     |
| Dissolved Arsenic      | mg/L       | 0.0024                       | 0.0680                                   | 0.0015   | -                     | -38                                                 | -98           | -                                                                         | -             | 0.005                                 | 0.5                  | 0.3                                    |
| Chloride               | mg/L       | 620                          | 630                                      | 17       | -                     | -97                                                 | -97           | -                                                                         | -             | 120                                   | --                   | 1000                                   |
| Dissolved Copper       | mg/L       | 0.0014                       | 0.016                                    | 0.0007   | -                     | -50                                                 | -96           | -                                                                         | -             | 0.002                                 | 0.3                  | 0.1                                    |
| Fluoride               | mg/L       | 0.19                         | 0.24                                     | 0.29     | -                     | 53                                                  | 21            | -                                                                         | -             | 0.12                                  | --                   | --                                     |
| Hardness               | mg CaCO3/L | 300                          | 310                                      | 193      | -                     | -36                                                 | -38           | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Lead         | mg/L       | 0.0016                       | 0.0076                                   | 0.0002   | -                     | -91                                                 | -98           | -                                                                         | -             | 0.001                                 | 0.2                  | 0.1                                    |
| Dissolved Nickel       | mg/L       | 0.003                        | 0.093                                    | 0.0187   | -                     | 545                                                 | -80           | -                                                                         | -             | 0.025                                 | 0.5                  | 0.2                                    |
| Dissolved Barium       | mg/L       | 0.041                        | 0.0630                                   | 0.0107   | -                     | -74                                                 | -83           | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Cadmium      | mg/L       | 0.000076                     | 0.00027                                  | 0.0001   | -                     | -21                                                 | -78           | -                                                                         | -             | 0.00004                               | --                   | 0.002                                  |
| Dissolved Iron         | mg/L       | 0.37                         | 4.60                                     | 0.0050   | -                     | -99                                                 | -100          | -                                                                         | -             | 0.3                                   | --                   | --                                     |
| Dissolved Mercury      | mg/L       | 0.0000059                    | 0.0000540                                | 0.00001  | -                     | -15                                                 | -91           | -                                                                         | -             | 0.000026                              | --                   | 0.0004                                 |
| Dissolved Manganese    | mg/L       | 0.19                         | 0.66                                     | 0.1187   | -                     | -38                                                 | -82           | -                                                                         | -             | 0.23                                  | --                   | --                                     |
| Dissolved Molybdenum   | mg/L       | 0.013                        | 0.013                                    | 0.0202   | -                     | 55                                                  | 55            | -                                                                         | -             | 0.073                                 | --                   | --                                     |
| Dissolved Selenium     | mg/L       | 0.0003                       | 0.0012                                   | 0.0010   | -                     | 245                                                 | -17           | -                                                                         | -             | 0.001                                 | --                   | --                                     |
| Dissolved Thallium     | mg/L       | 0.00003                      | 0.00012                                  | 0.0004   | -                     | 1 190                                               | 233           | -                                                                         | -             | 0.0008                                | --                   | --                                     |
| Nitrate                | mgN/L      | 2.30                         | 4.00                                     | 6.88     | -                     | 199                                                 | 72            | -                                                                         | -             | 2.94                                  | --                   | 20                                     |
| Sulphate               | mg/L       | 31                           | 46                                       | 133      | -                     | 329                                                 | 189           | -                                                                         | -             | 128                                   | --                   | --                                     |
| Total dissolved solids | mg/L       | 960                          | 990                                      | 318      | -                     | -67                                                 | -68           | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Zinc         | mg/L       | 0.0076                       | 0.0850                                   | 0.0005   | -                     | -93                                                 | -99           | -                                                                         | -             | 0.013                                 | 0.5                  | 0.4                                    |

North Portage Pit Sumps Water Quality Year 4

| Parameters             | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile + |               | CCME<br>Guidelines**                  | MMER<br>Schedule 4** | Water License<br>Discharge to<br>3PL** |
|------------------------|------------|------------------------------|------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|---------------------------------------|----------------------|----------------------------------------|
|                        |            |                              |                                          | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor | Long Term,<br>Based on 3PL<br>quality | Max. Monthly<br>Mean | Max. Avg<br>Conc.                      |
| pH                     |            | 6.30                         | 6.10                                     | -        | -                     | -                                                   | -             | -                                                                         | -             | 6.5 to 9.0                            | 6.0 to 9.5           | 6.0 to 9.0                             |
| Alkalinity             | mg CaCO3/L | 0.05                         | 2.4                                      | 61       | -                     | 121 900                                             | 2 442         | -                                                                         | -             | --                                    | --                   | --                                     |
| Ammonia (unionized)    | mg N/L     | 0.003                        | 0.0014                                   | 0.0300   | -                     | 900                                                 | 2 043         | -                                                                         | -             | 0.016                                 | --                   | --                                     |
| Ammonia nitrogen       | mg N/L     | 12                           | 8.9                                      | 1.8      | -                     | -85                                                 | -80           | -                                                                         | -             | 1.83                                  | --                   | 16                                     |
| Dissolved Asenic       | mg/L       | 0.00005                      | 0.056                                    | 0.0003   | -                     | 456                                                 | -100          | -                                                                         | -             | 0.005                                 | 0.5                  | 0.3                                    |
| Chloride               | mg/L       | 0.0010                       | 0.25                                     | 17       | -                     | 1 683 573                                           | 6 500         | -                                                                         | -             | 120                                   | --                   | 1000                                   |
| Dissolved Copper       | mg/L       | 0.00001                      | 0.007                                    | 0.0014   | -                     | 12 627                                              | -80           | -                                                                         | -             | 0.002                                 | 0.3                  | 0.1                                    |
| Fluoride               | mg/L       | 0.000008                     | 0.031                                    | 0.25     | -                     | 3 124 900                                           | 706           | -                                                                         | -             | 0.12                                  | --                   | --                                     |
| Hardness               | mg CaCO3/L | 0.05                         | 8                                        | 166      | -                     | 368 789                                             | 1 975         | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Lead         | mg/L       | 0.000002                     | 0.0029                                   | 0.0002   | -                     | 6 718                                               | -95           | -                                                                         | -             | 0.001                                 | 0.2                  | 0.1                                    |
| Dissolved Nickel       | mg/L       | 0.00003                      | 0.043                                    | 0.0222   | -                     | 65 194                                              | -48           | -                                                                         | -             | 0.025                                 | 0.5                  | 0.2                                    |
| Dissolved Barium       | mg/L       | 0.00002                      | 0.013                                    | 0.0093   | -                     | 48 847                                              | -28           | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Cadmium      | mg/L       | 0.0000006                    | 0.000099                                 | 0.0001   | -                     | 8 233                                               | -49           | -                                                                         | -             | 0.00004                               | --                   | 0.002                                  |
| Dissolved Iron         | mg/L       | 0.000097                     | 2.1                                      | 0.0100   | -                     | 10 209                                              | -100          | -                                                                         | -             | 0.3                                   | --                   | --                                     |
| Dissolved Mercury      | mg/L       | 0.000000056                  | 0.000029                                 | 0.00001  | -                     | 8 829                                               | -83           | -                                                                         | -             | 0.000026                              | --                   | 0.0004                                 |
| Dissolved Manganese    | mg/L       | 0.0002                       | 0.22                                     | 0.1250   | -                     | 83 233                                              | -43           | -                                                                         | -             | 0.23                                  | --                   | --                                     |
| Dissolved Molybdenum   | mg/L       | 0.000004                     | 0.00081                                  | 0.0230   | -                     | 574 900                                             | 2 740         | -                                                                         | -             | 0.073                                 | --                   | --                                     |
| Dissolved Selenium     | mg/L       | 0.000003                     | 0.00058                                  | 0.0010   | -                     | 33 233                                              | 72            | -                                                                         | -             | 0.001                                 | --                   | --                                     |
| Dissolved Thallium     | mg/L       | 0.0000014                    | 0.000057                                 | 0.0008   | -                     | 57 043                                              | 1 304         | -                                                                         | -             | 0.0008                                | --                   | --                                     |
| Nitrate                | mgN/L      | 13                           | 10.00                                    | 6.03     | -                     | -54                                                 | -40           | -                                                                         | -             | 2.94                                  | --                   | 20                                     |
| Sulphate               | mg/L       | 0.011                        | 8.8                                      | 130      | -                     | 1 181 718                                           | 1 377         | -                                                                         | -             | 128                                   | --                   | --                                     |
| Total dissolved solids | mg/L       | 28                           | 41                                       | 303      | -                     | 982                                                 | 639           | -                                                                         | -             | --                                    | --                   | --                                     |
| Dissolved Zinc         | mg/L       | 0.000032                     | 0.037                                    | 0.0010   | -                     | 3 025                                               | -97           | -                                                                         | -             | 0.013                                 | 0.5                  | 0.4                                    |

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

\* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2018.

\*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2019 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 10**

**Water Quantity - Year 10^ (SURFACE RUNOFF & INFILTRATION)**

| Pits**     | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
|------------|----------------|---------------|--------------------------------------------|
| Portage    | 167 478        | 289 269       | 73                                         |
| Bay Goose  | 343 567        | 327 114       | -5                                         |
| Vault Pit* | 350 800        | 326 350       | -7                                         |

\*predicted volumes from August 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.2, Year 7 and include runoff to Vault Pit and other drainage area. In Year 10, the pits in Vault area are naturally reflooding.

\*\*For year 10, for Vault, use the runoff estimated in Figure 12-9. For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the ICRP update 2019.

**Vault Pit Sumps Water Quality Year 7**

| Parameters             | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
|                        |            |                           |                                    | Mean     | Lower 25th centile* | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                     |            | 8.00                      | 8.00                               | 8.00     | 7.97                | 0                                                | 0             | 0                                                                 | 0             | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity             | mg CaCO3/L | 0.220                     | 23                                 | 63       | 57                  | 28 536                                           | 174           | 25 809                                                            | 148           | --                              | --                | --                                      |
| Ammonia (unionized)    | mg N/L     | 0.40                      | 0.67                               | 0.0300   | 0.0200              | -93                                              | -96           | -95                                                               | -97           | 0.016                           | --                | --                                      |
| Ammonia nitrogen       | mg N/L     | 33                        | 55                                 | 1.18     | 0.81                | -96                                              | -98           | -98                                                               | -99           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic      | mg/L       | 0.00015                   | 0.120                              | 0.0039   | 0.0037              | 2 522                                            | -97           | 2 333                                                             | -97           | 0.005                           | 0.5               | 0.1                                     |
| Chloride               | mg/L       | 0.0075                    | 0.079                              | 11       | 9                   | 145 233                                          | 13 697        | 114 567                                                           | 10 786        | 120                             | --                | 500                                     |
| Dissolved Copper       | mg/L       | 0.0000150                 | 0.00180                            | 0.0023   | 0.0020              | 15 456                                           | 30            | 12 900                                                            | 8             | 0.002                           | 0.3               | 0.1                                     |
| Fluoride               | mg/L       | 0.0000150                 | 0.031                              | 0.17     | 0.16                | 1 155 456                                        | 459           | 1 066 567                                                         | 416           | 0.12                            | --                | --                                      |
| Hardness               | mg CaCO3/L | 0.27                      | 45                                 | 197      | 158                 | 72 986                                           | 339           | 58 233                                                            | 250           | --                              | --                | --                                      |
| Dissolved Lead         | mg/L       | 0.0000190                 | 0.000027                           | 0.0002   | 0.0002              | 7 795                                            | 456           | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel       | mg/L       | 0.000030                  | 0.00027                            | 0.0036   | 0.0033              | 11 900                                           | 1 233         | 10 900                                                            | 1 122         | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium       | mg/L       | 0.000054                  | 0.028                              | 0.0250   | 0.0232              | 46 258                                           | -11           | 42 863                                                            | -17           | --                              | --                | --                                      |
| Dissolved Cadmium      | mg/L       | 0.000019                  | 0.000027                           | 0.00001  | 0.00001             | 426                                              | -63           | 426                                                               | -63           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron         | mg/L       | 0.000150                  | 0.005                              | 0.0050   | 0.0050              | 3 233                                            | 4             | 3 233                                                             | 4             | 0.3                             | --                | --                                      |
| Dissolved Mercury      | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 2 532                                            | -81           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese    | mg/L       | 0.000042                  | 0.00540                            | 0.0545   | 0.0491              | 129 662                                          | 909           | 116 805                                                           | 809           | 0.23                            | --                | --                                      |
| Dissolved Molybdenum   | mg/L       | 0.000390                  | 0.07300                            | 0.0467   | 0.0359              | 11 874                                           | -36           | 9 105                                                             | -51           | 0.073                           | --                | --                                      |
| Dissolved Selenium     | mg/L       | 0.000097                  | 0.00130                            | 0.0003   | 0.0003              | 2 477                                            | -81           | 2 477                                                             | -81           | 0.001                           | --                | --                                      |
| Dissolved Thallium     | mg/L       | 0.0000050                 | 0.000054                           | 0.0001   | 0.0001              | 1 900                                            | 85            | 1 900                                                             | 85            | 0.0008                          | --                | --                                      |
| Nitrate                | mgN/L      | 36                        | 62                                 | 7.45     | 5.63                | -79                                              | -88           | -84                                                               | -91           | 2.94                            | --                | 50                                      |
| Sulphate               | mg/L       | 0.02                      | 24                                 | 134      | 104                 | 556 289                                          | 456           | 432 400                                                           | 333           | 128                             | --                | --                                      |
| Total dissolved solids | mg/L       | 76                        | 210                                | 312      | 273                 | 311                                              | 49            | 259                                                               | 30            | --                              | --                | --                                      |
| Dissolved Zinc         | mg/L       | 0.000097                  | 0.00120                            | 0.0012   | 0.0008              | 1 103                                            | -3            | 673                                                               | -38           | 0.013                           | 0.5               | 0.2                                     |

**Phaser Pit Sumps Water Quality Year 7**

| Parameters             | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
|                        |            |                           |                                    | Mean     | Lower 25th centile* | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                     |            | 8.00                      | 8.00                               | 7.48     | 7.10                | -6                                               | -6            | -11                                                               | -11           | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity             | mg CaCO3/L | 0.220                     | 23                                 | 46       | 43                  | 20 991                                           | 102           | 19 445                                                            | 87            | --                              | --                | --                                      |
| Ammonia (unionized)    | mg N/L     | 0.40                      | 0.67                               | 0.0280   | 0.0200              | -93                                              | -96           | -95                                                               | -97           | 0.016                           | --                | --                                      |
| Ammonia nitrogen       | mg N/L     | 33                        | 55                                 | 1.8      | 2.0                 | -95                                              | -97           | -94                                                               | -96           | 1.83                            | --                | 20                                      |
| Dissolved Arsenic      | mg/L       | 0.00015                   | 0.120                              | 0.0021   | 0.0018              | 1 327                                            | -98           | 1 100                                                             | -99           | 0.005                           | 0.5               | 0.1                                     |
| Chloride               | mg/L       | 0.0075                    | 0.079                              | 3        | 3                   | 40 700                                           | 3 773         | 37 233                                                            | 3 444         | 120                             | --                | 500                                     |
| Dissolved Copper       | mg/L       | 0.0000150                 | 0.00180                            | 0.0045   | 0.0039              | 30 033                                           | 151           | 25 900                                                            | 117           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride               | mg/L       | 0.0000150                 | 0.031                              | 0.13     | 0.11                | 839 900                                          | 306           | 733 233                                                           | 255           | 0.12                            | --                | --                                      |
| Hardness               | mg CaCO3/L | 0.27                      | 45                                 | 100      | 91                  | 37 011                                           | 123           | 33 604                                                            | 102           | --                              | --                | --                                      |
| Dissolved Lead         | mg/L       | 0.0000190                 | 0.000027                           | 0.0002   | 0.0002              | 7 795                                            | 456           | 7 795                                                             | 456           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel       | mg/L       | 0.000030                  | 0.00027                            | 0.0053   | 0.0050              | 17 433                                           | 1 848         | 16 567                                                            | 1 752         | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium       | mg/L       | 0.000054                  | 0.028                              | 0.0203   | 0.0174              | 37 456                                           | -28           | 32 122                                                            | -38           | --                              | --                | --                                      |
| Dissolved Cadmium      | mg/L       | 0.0000019                 | 0.000027                           | 0.00001  | 0.00001             | 532                                              | -56           | 426                                                               | -63           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron         | mg/L       | 0.000150                  | 0.005                              | 0.0150   | 0.0050              | 9 900                                            | 213           | 3 233                                                             | 4             | 0.3                             | --                | --                                      |
| Dissolved Mercury      | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 2 532                                            | -81           | 2 532                                                             | -81           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese    | mg/L       | 0.000042                  | 0.00540                            | 0.0839   | 0.0726              | 199 567                                          | 1 453         | 172 757                                                           | 1 244         | 0.23                            | --                | --                                      |
| Dissolved Molybdenum   | mg/L       | 0.000390                  | 0.07300                            | 0.0107   | 0.0078              | 2 633                                            | -85           | 1 900                                                             | -89           | 0.073                           | --                | --                                      |
| Dissolved Selenium     | mg/L       | 0.0000097                 | 0.00130                            | 0.0004   | 0.0003              | 4 436                                            | -66           | 2 477                                                             | -81           | 0.001                           | --                | --                                      |
| Dissolved Thallium     | mg/L       | 0.0000050                 | 0.000054                           | 0.0001   | 0.0001              | 1 900                                            | 85            | 1 900                                                             | 85            | 0.0008                          | --                | --                                      |
| Nitrate                | mgN/L      | 36                        | 62                                 | 3.3      | 2.1                 | -91                                              | -95           | -94                                                               | -97           | 2.94                            | --                | 50                                      |
| Sulphate               | mg/L       | 0.02                      | 24                                 | 59       | 61                  | 243 900                                          | 144           | 252 817                                                           | 153           | 128                             | --                | --                                      |
| Total dissolved solids | mg/L       | 76                        | 210                                | 174      | 172                 | 129                                              | -17           | 126                                                               | -18           | --                              | --                | --                                      |
| Dissolved Zinc         | mg/L       | 0.000097                  | 0.00120                            | 0.0005   | 0.0005              | 415                                              | -58           | 415                                                               | -58           | 0.013                           | 0.5               | 0.2                                     |

**Goose Island Pit Lake Water Quality Year 10**

| Parameters             | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Annual Average Water Quality Forecast Value*** | Lower 25% Centile Water Quality Forecast Value*** | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile * |               | % Difference between predicted vs measured- mean |                    | % Difference between predicted vs measured- Lower 25th percentile * |                    | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|------------------------|------------|---------------------------|------------------------------------|------------------------------------------------|---------------------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|--------------------------------------------------|--------------------|---------------------------------------------------------------------|--------------------|---------------------------------|-------------------|----------------------------------|
|                        |            |                           |                                    |                                                |                                                   | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Annual Average                                   | Lower 25th centile | Annual Average                                                      | Lower 25th centile | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                     |            | 6.1                       | 6.1                                |                                                |                                                   |          |                    |                                                  |               |                                                                     |               |                                                  |                    |                                                                     |                    | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity             | mg CaCO3/L | 27                        | 27                                 | 73                                             | 71                                                | 61       | -                  | 126                                              | 126           | -                                                                   | -             | -16                                              | -15                | -                                                                   | -                  | --                              | --                | --                               |
| Ammonia (unionized)    | mg N/L     | 0                         | 0                                  |                                                |                                                   | 0.3200   | -                  | 57 043                                           | 57 043        | -                                                                   | -             | -                                                | -                  | -                                                                   | -                  | 0.016                           | --                | --                               |
| Ammonia nitrogen       | mg N/L     | 5                         | 5                                  | 28                                             | 27                                                | 10.5     | -                  | 94                                               | 94            | -                                                                   | -             | -63                                              | -61                | -                                                                   | -                  | 1.83                            | --                | 16                               |
| Dissolved Arsenic      | mg/L       | 0.002                     | 0.002                              | 0.011                                          | 0.011                                             | 0.0146   | -                  | 813                                              | 813           | -                                                                   | -             | 28                                               | 32                 | -                                                                   | -                  | 0.005                           | 0.5               | 0.3                              |
| Chloride               | mg/L       | 440                       | 440                                | 153                                            | 148                                               | 80       | -                  | -82                                              | -82           | -                                                                   | -             | -48                                              | -46                | -                                                                   | -                  | 120                             | --                | 1000                             |
| Dissolved Copper       | mg/L       | 0.001                     | 0.001                              | 0.851                                          | 0.820                                             | 0.3543   | -                  | 37 195                                           | 37 195        | -                                                                   | -             | -58                                              | -57                | -                                                                   | -                  | 0.002                           | 0.3               | 0.1                              |
| Fluoride               | mg/L       | 0.130                     | 0.130                              | 0.630                                          | 0.613                                             | 0.54     | -                  | 315                                              | 315           | -                                                                   | -             | -14                                              | -12                | -                                                                   | -                  | 0.12                            | --                | --                               |
| Hardness               | mg CaCO3/L | 210                       | 210                                | 561                                            | 543                                               | 405      | -                  | 93                                               | 93            | -                                                                   | -             | -28                                              | -25                | -                                                                   | -                  | --                              | --                | --                               |
| Dissolved Lead         | mg/L       | 0.0011                    | 0.0011                             | 0.0003                                         | 0.0003                                            | 0.0002   | -                  | -86                                              | -86           | -                                                                   | -             | -54                                              | -53                | -                                                                   | -                  | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel       | mg/L       | 0.002                     | 0.002                              | 0.015                                          | 0.015                                             | 0.0150   | -                  | 650                                              | 650           | -                                                                   | -             | -2                                               | 0                  | -                                                                   | -                  | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium       | mg/L       | 0.027                     | 0.027                              | 0.050                                          | 0.048                                             | 0.0303   | -                  | 12                                               | 12            | -                                                                   | -             | -39                                              | -37                | -                                                                   | -                  | --                              | --                | --                               |
| Dissolved Cadmium      | mg/L       | 0.000                     | 0.000                              | 0.000                                          | 0.000                                             | 0.0000   | -                  | -80                                              | -80           | -                                                                   | -             | -95                                              | -94                | -                                                                   | -                  | 0.00004                         | --                | 0.002                            |
| Dissolved Iron         | mg/L       | 0.250                     | 0.250                              | 0.384                                          | 0.371                                             | 0.0050   | -                  | -98                                              | -98           | -                                                                   | -             | -99                                              | -99                | -                                                                   | -                  | 0.3                             | --                | --                               |
| Dissolved Mercury      | mg/L       | 0.0000                    | 0.0000                             | 0.0000                                         | 0.0000                                            | 0.00001  | -                  | 28                                               | 28            | -                                                                   | -             | -78                                              | -77                | -                                                                   | -                  | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese    | mg/L       | 0.1300                    | 0.1300                             | 0.1026                                         | 0.0905                                            | 0.0309   | -                  | -76                                              | -76           | -                                                                   | -             | -70                                              | -66                | -                                                                   | -                  | 0.23                            | --                | --                               |
| Dissolved Molybdenum   | mg/L       | 0.0086                    | 0.0086                             | 0.2881                                         | 0.2780                                            | 0.1025   | -                  | 1 092                                            | 1 092         | -                                                                   | -             | -64                                              | -63                | -                                                                   | -                  | 0.073                           | --                | --                               |
| Dissolved Selenium     | mg/L       | 0.0002                    | 0.0002                             | 0.0535                                         | 0.0516                                            | 0.0015   | -                  | 650                                              | 650           | -                                                                   | -             | -97                                              | -97                | -                                                                   | -                  | 0.001                           | --                | --                               |
| Dissolved Thallium     | mg/L       | 0.0000                    | 0.0000                             | 0.0012                                         | 0.0011                                            | 0.0001   | -                  | 400                                              | 400           | -                                                                   | -             | -92                                              | -91                | -                                                                   | -                  | 0.0008                          | --                | --                               |
| Nitrate                | mgN/L      | 4.0                       | 4.0                                | 4.8                                            | 4.6                                               | 1.90     | -                  | -53                                              | -53           | -                                                                   | -             | -60                                              | -59                | -                                                                   | -                  | 2.94                            | --                | 20                               |
| Sulphate               | mg/L       | 21                        | 21                                 | 1979                                           | 1909                                              | 469      | -                  | 2 133                                            | 2 133         | -                                                                   | -             | -76                                              | -75                | -                                                                   | -                  | 128                             | --                | --                               |
| Total dissolved solids | mg/L       | 670                       | 670                                | 1996                                           | 1932                                              | 803      | -                  | 20                                               | 20            | -                                                                   | -             | -60                                              | -58                | -                                                                   | -                  | --                              | --                | --                               |
| Dissolved Zinc         | mg/L       | 0.0051                    | 0.0051                             | 0.0038                                         | 0.0035                                            | 0.0005   | -                  | -90                                              | -90           | -                                                                   | -             | -87                                              | -86                | -                                                                   | -                  | 0.013                           | 0.5               | 0.4                              |

**Third Portage Pit Sumps Water Quality Year 10 (Pit E)**

| Parameters             | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Annual Average Water<br>Quality Forecast<br>Value*** | Lower 25%<br>Centile Water<br>Quality<br>Forecasted<br>Value*** | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile * |               | % Difference between<br>predicted vs measured-<br>mean |                          | % Difference<br>between predicted vs<br>measured- Lower<br>25th percentile |                          | CCME<br>Guideline<br>s**         | MMER<br>Schedule<br>4** | Water<br>License<br>Discharge<br>to 3PL ** |
|------------------------|------------|------------------------------|------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|--------------------------------------------------------|--------------------------|----------------------------------------------------------------------------|--------------------------|----------------------------------|-------------------------|--------------------------------------------|
|                        |            |                              |                                          |                                                      |                                                                 | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor | Annual<br>Average                                      | Lower<br>25th<br>centile | Annual<br>Average                                                          | Lower<br>25th<br>centile | Long<br>Term,<br>Based on<br>3PL | Max.<br>Monthly<br>Mean | Max. Avg.<br>Conc.                         |
| pH                     |            | 6.3                          | 6.1                                      |                                                      |                                                                 | 7.69     | 7.62                  | 22                                                  | 26            | 21                                                                        | 25            |                                                        |                          |                                                                            |                          | 6.5 to 9.0                       | 6.0 to 9.5              | 6.0 to 9.0                                 |
| Alkalinity             | mg CaCO3/L | 40                           | 43                                       | 158                                                  | 125                                                             | 60       | 46                    | 51                                                  | 40            | 15                                                                        | 7             | -62                                                    | -52                      | -71                                                                        | -63                      | --                               | --                      | --                                         |
| Ammonia (unionized)    | mg N/L     | 0                            | 0                                        |                                                      |                                                                 | 0.11     | 0.06                  | 21 246                                              | 20 082        | 11 438                                                                    | 10 809        |                                                        |                          |                                                                            |                          | 0.016                            | --                      | --                                         |
| Ammonia nitrogen       | mg N/L     | 2                            | 4                                        | 14                                                   | 5                                                               | 5.44     | 2.44                  | 159                                                 | 56            | 16                                                                        | 30            | -60                                                    | 20                       | -82                                                                        | -46                      | 1.83                             | --                      | 16                                         |
| Dissolved Arsenic      | mg/L       | 0.002                        | 0.068                                    | 0.654                                                | 0.024                                                           | 0.0024   | 0.0020                | 1                                                   | -96           | -17                                                                       | -97           | -100                                                   | -90                      | -100                                                                       | -92                      | 0.005                            | 0.5                     | 0.3                                        |
| Chloride               | mg/L       | 620                          | 630                                      | 74                                                   | 31                                                              | 30.14    | 26.60                 | -95                                                 | -95           | -96                                                                       | -96           | -59                                                    | -3                       | -64                                                                        | -14                      | 120                              | --                      | 1000                                       |
| Dissolved Copper       | mg/L       | 0.001                        | 0.016                                    | 0.574                                                | 0.002                                                           | 0.0019   | 0.0008                | 33                                                  | -88           | -43                                                                       | -95           | -100                                                   | -22                      | -100                                                                       | -66                      | 0.002                            | 0.3                     | 0.1                                        |
| Fluoride               | mg/L       | 0.190                        | 0.240                                    | 0.577                                                | 0.540                                                           | 0.39     | 0.40                  | 104                                                 | 62            | 111                                                                       | 67            | -33                                                    | -28                      | -31                                                                        | -26                      | 0.12                             | --                      | --                                         |
| Hardness               | mg CaCO3/L | 300                          | 310                                      | 1023                                                 | 393                                                             | 280      | 280                   | -7                                                  | -10           | -7                                                                        | -10           | -73                                                    | -29                      | -73                                                                        | -29                      | --                               | --                      | --                                         |
| Dissolved Lead         | mg/L       | 0.0016                       | 0.0076                                   | 0.0013                                               | 0.0003                                                          | 0.00015  | 0.00015               | -91                                                 | -98           | -91                                                                       | -98           | -88                                                    | -50                      | -88                                                                        | -50                      | 0.001                            | 0.2                     | 0.1                                        |
| Dissolved Nickel       | mg/L       | 0.003                        | 0.093                                    | 0.035                                                | 0.023                                                           |          |                       |                                                     |               |                                                                           |               |                                                        |                          |                                                                            |                          | 0.025                            | 0.5                     | 0.2                                        |
| Dissolved Barium       | mg/L       | 0.041                        | 0.063                                    | 0.146                                                | 0.029                                                           | 0.0131   | 0.0126                | -68                                                 | -79           | -69                                                                       | -80           | -91                                                    | -54                      | -91                                                                        | -56                      | --                               | --                      | --                                         |
| Dissolved Cadmium      | mg/L       | 0.000                        | 0.000                                    | 0.000                                                | 0.000                                                           | 0.0000   | 0.0000                | -87                                                 | -96           | -87                                                                       | -96           | -97                                                    | -95                      | -97                                                                        | -95                      | 0.00004                          | --                      | 0.002                                      |
| Dissolved Iron         | mg/L       | 0.370                        | 4.600                                    | 1.241                                                | 0.020                                                           | 0.03     | 0.01                  | -91                                                 | -99           | -99                                                                       | -100          | -97                                                    | 62                       | -100                                                                       | -75                      | 0.3                              | --                      | --                                         |
| Dissolved Mercury      | mg/L       | 0.0000                       | 0.0001                                   | 0.0000                                               | 0.0000                                                          | 0.00001  | 0.00001               | -15                                                 | -91           | -15                                                                       | -91           | -89                                                    | -87                      | -89                                                                        | -87                      | 0.000026                         | --                      | 0.0004                                     |
| Dissolved Manganese    | mg/L       | 0.1900                       | 0.6600                                   | 0.1715                                               | 0.1307                                                          | 0.0958   | 0.0464                | -50                                                 | -85           | -76                                                                       | -93           | -44                                                    | -27                      | -73                                                                        | -64                      | 0.23                             | --                      | --                                         |
| Dissolved Molybdenum   | mg/L       | 0.0130                       | 0.0130                                   | 0.1114                                               | 0.0765                                                          | 0.0396   | 0.0327                | 204                                                 | 204           | 152                                                                       | 152           | -64                                                    | -48                      | -71                                                                        | -57                      | 0.073                            | --                      | --                                         |
| Dissolved Selenium     | mg/L       | 0.0003                       | 0.0012                                   | 0.0031                                               | 0.0014                                                          | 0.0004   | 0.0003                | 38                                                  | -67           | -14                                                                       | -79           | -87                                                    | -71                      | -92                                                                        | -82                      | 0.001                            | --                      | --                                         |
| Dissolved Thallium     | mg/L       | 0.0000                       | 0.0001                                   | 0.0011                                               | 0.0011                                                          | 0.0001   | 0.0001                | 223                                                 | -17           | 223                                                                       | -17           | -91                                                    | -90                      | -91                                                                        | -90                      | 0.0008                           | --                      | --                                         |
| Nitrate                | mgN/L      | 2.3                          | 4.0                                      | 10.4                                                 | 7.9                                                             | 10.6     | 7.3                   | 363                                                 | 166           | 219                                                                       | 83            | 2                                                      | 34                       | -30                                                                        | -8                       | 2.94                             | --                      | 20                                         |
| Sulphate               | mg/L       | 31                           | 46                                       | 1590                                                 | 251                                                             | 239      | 240                   | 671                                                 | 420           | 674                                                                       | 422           | -85                                                    | -5                       | -85                                                                        | -4                       | 128                              | --                      | --                                         |
| Total dissolved solids | mg/L       | 960                          | 990                                      | 2188                                                 | 588                                                             | 481      | 424                   | -50                                                 | -51           | -56                                                                       | -57           | -78                                                    | -18                      | -81                                                                        | -28                      | --                               | --                      | --                                         |
| Dissolved Zinc         | mg/L       | 0.0076                       | 0.0850                                   | 0.0040                                               | 0.0034                                                          | 0.001    | 0.001                 | -93                                                 | -99           | -93                                                                       | -99           | -87                                                    | -85                      | -87                                                                        | -85                      | 0.013                            | 0.5                     | 0.4                                        |

| North Portage Pit Sumps Water Quality Year 10 (Pit A) |            |                              |                                          |                                                      |                                                                 |          |                       |                                                     |               |                                                                           |               |                                                        |                          |                                                                              |                          |                          |                         |                                            |
|-------------------------------------------------------|------------|------------------------------|------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|--------------------------------------------------------|--------------------------|------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------|--------------------------------------------|
| Parameters                                            | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Annual Average Water<br>Quality Forecast<br>Value*** | Lower 25%<br>Centile Water<br>Quality<br>Forecasted<br>Value*** | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile + |               | % Difference between<br>predicted vs measured-<br>mean |                          | % Difference<br>between predicted vs<br>measured- Lower<br>25th percentile + |                          | CCME<br>Guideline<br>s** | MMER<br>Schedule<br>4** | Water<br>License<br>Discharge<br>to 2014** |
|                                                       |            |                              |                                          |                                                      |                                                                 | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor | Annual<br>Average                                      | Lower<br>25th<br>centile | Annual<br>Average                                                            | Lower<br>25th<br>centile |                          |                         |                                            |
| pH                                                    |            | 6.3                          | 6.1                                      |                                                      |                                                                 | 7.84     | -                     | 24                                                  | 28            | -                                                                         | -             |                                                        |                          | -                                                                            | -                        | 6.5 to 9.0               | 6.0 to 9.5              | 6.0 to 9.0                                 |
| Alkalinity                                            | mg CaCO3/L | 0                            | 2                                        | 49                                                   | 41                                                              | 70       | -                     | 139 900                                             | 2 817         | -                                                                         | -             | 44                                                     | 73                       | -                                                                            | -                        | --                       | --                      | --                                         |
| Ammonia (unionized)                                   | mg N/L     | 0.0                          | 0.0                                      |                                                      |                                                                 | 0.1050   | -                     | 3 400                                               | 7 400         | -                                                                         | -             |                                                        |                          |                                                                              |                          | 0.016                    | --                      | --                                         |
| Ammonia nitrogen                                      | mg N/L     | 12                           | 9                                        | 19                                                   | 17                                                              | 6.7      | -                     | -44                                                 | -24           | -                                                                         | -             | -65                                                    | -60                      |                                                                              |                          | 1.83                     | --                      | 16                                         |
| Dissolved Asenic                                      | mg/L       | 0.000                        | 0.056                                    | 0.008                                                | 0.007                                                           | 0.2721   | -                     | 604 567                                             | 386           | -                                                                         | -             | 3 318                                                  | 3 731                    | -                                                                            | -                        | 0.005                    | 0.5                     | 0.3                                        |
| Chloride                                              | mg/L       | 0                            | 0                                        | 106                                                  | 96                                                              | 162      | -                     | 16 479 492                                          | 64 500        | -                                                                         | -             | 53                                                     | 68                       | -                                                                            | -                        | 120                      | --                      | 1000                                       |
| Dissolved Copper                                      | mg/L       | 0.000                        | 0.007                                    | 0.530                                                | 0.434                                                           | 0.0249   | -                     | 225 809                                             | 255           | -                                                                         | -             | -95                                                    | -94                      | -                                                                            | -                        | 0.002                    | 0.3                     | 0.1                                        |
| Fluoride                                              | mg/L       | 0.000                        | 0.031                                    | 0.404                                                | 0.326                                                           | 0.38     | -                     | 4 687 400                                           | 1 110         | -                                                                         | -             | -7                                                     | 15                       | -                                                                            | -                        | 0.12                     | --                      | --                                         |
| Hardness                                              | mg CaCO3/L | 0                            | 8                                        | 351                                                  | 285                                                             | 631      | -                     | 1 401 011                                           | 7 781         | -                                                                         | -             | 80                                                     | 121                      | -                                                                            | -                        | --                       | --                      | --                                         |
| Dissolved Lead                                        | mg/L       | 0.0000                       | 0.0029                                   | 0.0002                                               | 0.0002                                                          | 0.0002   | -                     | 6 718                                               | -95           | -                                                                         | -             | -37                                                    | -28                      | -                                                                            | -                        | 0.001                    | 0.2                     | 0.1                                        |
| Dissolved Nickel                                      | mg/L       | 0.000                        | 0.043                                    | 0.010                                                | 0.009                                                           | 0.0640   | -                     | 188 135                                             | 49            | -                                                                         | -             | 513                                                    | 627                      | -                                                                            | -                        | 0.025                    | 0.5                     | 0.2                                        |
| Dissolved Barium                                      | mg/L       | 0.000                        | 0.013                                    | 0.032                                                | 0.026                                                           | 0.0273   | -                     | 143 584                                             | 110           | -                                                                         | -             | -14                                                    | 4                        | -                                                                            | -                        | --                       | --                      | --                                         |
| Dissolved Cadmium                                     | mg/L       | 0.000                        | 0.000                                    | 0.000                                                | 0.000                                                           | 0.0001   | -                     | 18 233                                              | 11            | -                                                                         | -             | 4                                                      | 41                       | -                                                                            | -                        | 0.00004                  | --                      | 0.002                                      |
| Dissolved Iron                                        | mg/L       | 0.000                        | 2.100                                    | 0.245                                                | 0.199                                                           | 0.0625   | -                     | 64 333                                              | -97           | -                                                                         | -             | -74                                                    | -69                      | -                                                                            | -                        | 0.3                      | --                      | --                                         |
| Dissolved Mercury                                     | mg/L       | 0.0000                       | 0.0000                                   | 0.0000                                               | 0.0000                                                          | 0.00001  | -                     | 8 829                                               | -83           | -                                                                         | -             | -71                                                    | -68                      | -                                                                            | -                        | 0.000026                 | --                      | 0.0004                                     |
| Dissolved Manganese                                   | mg/L       | 0.0002                       | 0.2200                                   | 0.0627                                               | 0.0450                                                          | 0.8817   | -                     | 587 667                                             | 301           | -                                                                         | -             | 1 306                                                  | 1 861                    | -                                                                            | -                        | 0.23                     | --                      | --                                         |
| Dissolved Molybdenum                                  | mg/L       | 0.0000                       | 0.0008                                   | 0.1792                                               | 0.1464                                                          | 0.1533   | -                     | 3 831 150                                           | 18 820        | -                                                                         | -             | -14                                                    | 5                        | -                                                                            | -                        | 0.073                    | --                      | --                                         |
| Dissolved Selenium                                    | mg/L       | 0.0000                       | 0.0006                                   | 0.0328                                               | 0.0264                                                          | 0.0075   | -                     | 249 900                                             | 1 193         | -                                                                         | -             | -77                                                    | -72                      | -                                                                            | -                        | 0.001                    | --                      | --                                         |
| Dissolved Thallium                                    | mg/L       | 0.0000                       | 0.0001                                   | 0.0007                                               | 0.0004                                                          | 0.0001   | -                     | 7 043                                               | 75            | -                                                                         | -             | -85                                                    | -75                      | -                                                                            | -                        | 0.0008                   | --                      | --                                         |
| Nitrate                                               | mgN/L      | 13.0                         | 10.0                                     | 3.5                                                  | 3.2                                                             | 4.59     | -                     | -65                                                 | -54           | -                                                                         | -             | 31                                                     | 43                       | -                                                                            | -                        | 2.94                     | --                      | 20                                         |
| Sulphate                                              | mg/L       | 0                            | 9                                        | 1342                                                 | 1199                                                            | 916      | -                     | 8 322 627                                           | 10 303        | -                                                                         | -             | -32                                                    | -24                      | -                                                                            | -                        | 128                      | --                      | --                                         |
| Total dissolved solids                                | mg/L       | 28                           | 41                                       | 1374                                                 | 1240                                                            | 1391     | -                     | 4 866                                               | 3 291         | -                                                                         | -             | 1                                                      | 12                       | -                                                                            | -                        | --                       | --                      | --                                         |
| Dissolved Zinc                                        | mg/L       | 0.0000                       | 0.0370                                   | 0.0035                                               | 0.0033                                                          | 0.0005   | -                     | 1 463                                               | -99           | -                                                                         | -             | -86                                                    | -85                      | -                                                                            | -                        | 0.013                    | 0.5                     | 0.4                                        |

**Footnotes:**  
 Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.  
 \* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0  
 \*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).  
 \*\*\* Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2019, Doc. No. 662987-5000-4EER-0001, rev. 00.  
 + Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.  
 Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2020 Comparison of predicted pit water quantity and quality to the measured water quantity and quality**  
**MINING YEAR 11**

**Water Quantity - Year 11^ (SURFACE RUNOFF & INFILTRATION)**

| Pits**     | Predicted (m³) | Measured (m³) | % Difference between predicted vs measured |
|------------|----------------|---------------|--------------------------------------------|
| Portage    | 167 616        | 302 500       | 80                                         |
| Bay Goose  | 344 535        | 389 350       | 13                                         |
| Vault Pit^ | 350 800        | 326 350       | -7                                         |

^predicted volumes from August 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.2, Year 7 and include runoff to Vault Pi and other drainage area. In Year 11, the pits in Vault area are naturally reflooding.

\*\*For Year 11, for Vault, use the runoff estimated in Table 12.2. For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the ICRP update 2019.

**Vault Pit Sumps Water Quality Year 7**

| Parameters             | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
|                        |            |                           |                                    | Mean     | Lower 25th centile* | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                     |            | 8.00                      | 8.00                               | 7.97     | 7.92                | 0                                                | 0             | -1                                                                | -1            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity             | mg CaCO3/L | 0.220                     | 23                                 | 55       | 46                  | 24 900                                           | 139           | 20 809                                                            | 100           | --                              | --                | --                                      |
| Ammonia (unionized)    | mg N/L     | 0.40                      | 0.67                               | 0.0100   | 0.0100              | -98                                              | -99           | -98                                                               | -99           | 0.016                           | --                | --                                      |
| Ammonia nitrogen       | mg N/L     | 33                        | 55                                 | 0.15     | 0.12                | -100                                             | -100          | -100                                                              | -100          | 1.83                            | --                | 20                                      |
| Dissolved Arsenic      | mg/L       | 0.00015                   | 0.120                              | 0.0034   | 0.0030              | 2 153                                            | -97           | 1 900                                                             | -98           | 0.005                           | 0.5               | 0.1                                     |
| Chloride               | mg/L       | 0.0075                    | 0.079                              | 8        | 8                   | 110 300                                          | 10 381        | 110 567                                                           | 10 406        | 120                             | --                | 500                                     |
| Dissolved Copper       | mg/L       | 0.0000150                 | 0.00180                            | 0.0014   | 0.0005              | 8 967                                            | -24           | 3 233                                                             | -72           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride               | mg/L       | 0.0000150                 | 0.031                              | 0.10     | 0.09                | 693 233                                          | 235           | 599 900                                                           | 190           | 0.12                            | --                | --                                      |
| Hardness               | mg CaCO3/L | 0.27                      | 45                                 | 119      | 111                 | 43 900                                           | 164           | 41 011                                                            | 147           | --                              | --                | --                                      |
| Dissolved Lead         | mg/L       | 0.00000190                | 0.000027                           | 0.0002   | 0.0002              | 11 584                                           | 722           | 8 847                                                             | 530           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel       | mg/L       | 0.000030                  | 0.00027                            | 0.0015   | 0.0014              | 5 033                                            | 470           | 4 567                                                             | 419           | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium       | mg/L       | 0.000054                  | 0.028                              | 0.0110   | 0.0098              | 20 233                                           | -61           | 18 048                                                            | -65           | --                              | --                | --                                      |
| Dissolved Cadmium      | mg/L       | 0.0000019                 | 0.000027                           | 0.00002  | 0.00002             | 953                                              | -26           | 953                                                               | -26           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron         | mg/L       | 0.000150                  | 0.005                              | 0.0100   | 0.0100              | 6 567                                            | 108           | 6 567                                                             | 108           | 0.3                             | --                | --                                      |
| Dissolved Mercury      | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 5 163                                            | -63           | 5 163                                                             | -63           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese    | mg/L       | 0.000042                  | 0.00540                            | 0.0112   | 0.0026              | 26 471                                           | 107           | 6 090                                                             | -52           | 0.23                            | --                | --                                      |
| Dissolved Molybdenum   | mg/L       | 0.000390                  | 0.07300                            | 0.0188   | 0.0128              | 4 726                                            | -74           | 3 182                                                             | -82           | 0.073                           | --                | --                                      |
| Dissolved Selenium     | mg/L       | 0.0000097                 | 0.00130                            | 0.0011   | 0.0010              | 11 034                                           | -17           | 10 209                                                            | -23           | 0.001                           | --                | --                                      |
| Dissolved Thallium     | mg/L       | 0.0000050                 | 0.000054                           | 0.0002   | 0.0002              | 3 900                                            | 270           | 3 900                                                             | 270           | 0.0008                          | --                | --                                      |
| Nitrate                | mg/N/L     | 36                        | 62                                 | 2.23     | 1.80                | -94                                              | -96           | -95                                                               | -97           | 2.94                            | --                | 50                                      |
| Sulphate               | mg/L       | 0.02                      | 24                                 | 62       | 45                  | 257 233                                          | 157           | 187 400                                                           | 88            | 128                             | --                | --                                      |
| Total dissolved solids | mg/L       | 76                        | 210                                | 125      | 101                 | 64                                               | -40           | 33                                                                | -52           | --                              | --                | --                                      |
| Dissolved Zinc         | mg/L       | 0.000097                  | 0.00120                            | 0.0010   | 0.0010              | 931                                              | -17           | 931                                                               | -17           | 0.013                           | 0.5               | 0.2                                     |

**Phaser Pit Sumps Water Quality Year 7**

| Parameters             | Units      | Probable Scenario Year 7* | Possible Poor end Scenario Year 7* | Measured |                     | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile |               | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to Wally Lake** |
|------------------------|------------|---------------------------|------------------------------------|----------|---------------------|--------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|---------------------------------|-------------------|-----------------------------------------|
|                        |            |                           |                                    | Mean     | Lower 25th centile* | Probable                                         | Possible Poor | Probable                                                          | Possible Poor | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                          |
| pH                     |            | 8.00                      | 8.00                               | 7.75     | 7.56                | -3                                               | -3            | -6                                                                | -6            | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                              |
| Alkalinity             | mg CaCO3/L | 0.220                     | 23                                 | 40       | 28                  | 17 880                                           | 72            | 12 627                                                            | 22            | --                              | --                | --                                      |
| Ammonia (unionized)    | mg N/L     | 0.40                      | 0.67                               | 0.0100   | 0.0100              | -98                                              | -99           | -98                                                               | -99           | 0.016                           | --                | --                                      |
| Ammonia nitrogen       | mg N/L     | 33                        | 55                                 | 0.1      | 0.0                 | -100                                             | -100          | -100                                                              | -100          | 1.83                            | --                | 20                                      |
| Dissolved Arsenic      | mg/L       | 0.00015                   | 0.120                              | 0.0010   | 0.0007              | 589                                              | -99           | 367                                                               | -99           | 0.005                           | 0.5               | 0.1                                     |
| Chloride               | mg/L       | 0.0075                    | 0.079                              | 2        | 1                   | 24 048                                           | 2 193         | 17 233                                                            | 1 546         | 120                             | --                | 500                                     |
| Dissolved Copper       | mg/L       | 0.0000150                 | 0.00180                            | 0.0018   | 0.0009              | 11 826                                           | -1            | 5 900                                                             | -50           | 0.002                           | 0.3               | 0.1                                     |
| Fluoride               | mg/L       | 0.0000150                 | 0.031                              | 0.08     | 0.06                | 518 419                                          | 151           | 399 900                                                           | 94            | 0.12                            | --                | --                                      |
| Hardness               | mg CaCO3/L | 0.27                      | 45                                 | 77       | 66                  | 28 501                                           | 72            | 24 344                                                            | 47            | --                              | --                | --                                      |
| Dissolved Lead         | mg/L       | 0.00000190                | 0.000027                           | 0.0002   | 0.0002              | 11 888                                           | 744           | 8 847                                                             | 530           | 0.001                           | 0.2               | 0.1                                     |
| Dissolved Nickel       | mg/L       | 0.000030                  | 0.00027                            | 0.0034   | 0.0023              | 11 122                                           | 1 147         | 7 567                                                             | 752           | 0.025                           | 0.5               | 0.2                                     |
| Dissolved Barium       | mg/L       | 0.000054                  | 0.028                              | 0.0095   | 0.0057              | 17 410                                           | -66           | 10 456                                                            | -80           | --                              | --                | --                                      |
| Dissolved Cadmium      | mg/L       | 0.0000019                 | 0.000027                           | 0.00002  | 0.00002             | 953                                              | -26           | 953                                                               | -26           | 0.00004                         | --                | 0.002                                   |
| Dissolved Iron         | mg/L       | 0.000150                  | 0.005                              | 0.0111   | 0.0100              | 7 307                                            | 131           | 6 567                                                             | 108           | 0.3                             | --                | --                                      |
| Dissolved Mercury      | mg/L       | 0.000000190               | 0.000027                           | 0.00001  | 0.00001             | 5 163                                            | -63           | 5 163                                                             | -63           | 0.000026                        | --                | 0.0004                                  |
| Dissolved Manganese    | mg/L       | 0.000042                  | 0.00540                            | 0.0213   | 0.0005              | 50 561                                           | 294           | 1 090                                                             | -91           | 0.23                            | --                | --                                      |
| Dissolved Molybdenum   | mg/L       | 0.000390                  | 0.07300                            | 0.0035   | 0.0018              | 792                                              | -95           | 362                                                               | -98           | 0.073                           | --                | --                                      |
| Dissolved Selenium     | mg/L       | 0.0000097                 | 0.00130                            | 0.0009   | 0.0010              | 9 637                                            | -27           | 10 209                                                            | -23           | 0.001                           | --                | --                                      |
| Dissolved Thallium     | mg/L       | 0.0000050                 | 0.000054                           | 0.0002   | 0.0002              | 3 900                                            | 270           | 3 900                                                             | 270           | 0.0008                          | --                | --                                      |
| Nitrate                | mg/N/L     | 36                        | 62                                 | 1.4      | 0.8                 | -96                                              | -98           | -98                                                               | -99           | 2.94                            | --                | 50                                      |
| Sulphate               | mg/L       | 0.02                      | 24                                 | 32       | 26                  | 135 270                                          | 35            | 109 483                                                           | 10            | 128                             | --                | --                                      |
| Total dissolved solids | mg/L       | 76                        | 210                                | 83       | 59                  | 10                                               | -60           | -22                                                               | -72           | --                              | --                | --                                      |
| Dissolved Zinc         | mg/L       | 0.000097                  | 0.00120                            | 0.0010   | 0.0010              | 931                                              | -17           | 931                                                               | -17           | 0.013                           | 0.5               | 0.2                                     |

**Goose Island Pit Lake Water Quality Year 11**

| Parameters             | Units      | Probable Scenario Year 3* | Possible Poor end Scenario Year 3* | Annual Average Water Quality Forecast Value*** | Lower 25% Centile Water Quality Forecasted Value*** | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile * |               | % Difference between predicted vs measured- mean |                    | % Difference between predicted vs measured- Lower 25th percentile * |                    | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|------------------------|------------|---------------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|--------------------------------------------------|--------------------|---------------------------------------------------------------------|--------------------|---------------------------------|-------------------|----------------------------------|
|                        |            |                           |                                    |                                                |                                                     | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Annual Average                                   | Lower 25th centile | Annual Average                                                      | Lower 25th centile | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg Conc.                   |
| pH                     |            | 6.1                       | 6.1                                |                                                |                                                     | 7.99     | 7.93               |                                                  |               |                                                                     |               |                                                  |                    |                                                                     |                    | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity             | mg CaCO3/L | 27                        | 27                                 | 43                                             | 23                                                  | 81       | 63                 | 201                                              | 201           | 133                                                                 | 133           | 90                                               | 249                | 47                                                                  | 171                | --                              | --                | --                               |
| Ammonia (unionized)    | mg N/L     | 0                         | 0                                  |                                                |                                                     | 0.5914   | 0.2550             | 105 512                                          | 105 512       | 45 436                                                              | 45 436        |                                                  |                    |                                                                     |                    | 0.016                           | --                | --                               |
| Ammonia nitrogen       | mg N/L     | 5                         | 5                                  | 11                                             | 4                                                   | 19.2     | 10.7               | 256                                              | 256           | 97                                                                  | 97            | 69                                               | 387                | -7                                                                  | 169                | 1.83                            | --                | 16                               |
| Dissolved Arsenic      | mg/L       | 0.002                     | 0.002                              | 0.005                                          | 0.002                                               | 0.6715   | 0.4305             | 41 868                                           | 41 868        | 26 806                                                              | 26 806        | 13 333                                           | 32 437             | 8 512                                                               | 20 760             | 0.005                           | 0.5               | 0.3                              |
| Chloride               | mg/L       | 440                       | 440                                | 63                                             | 23                                                  | 193      | 109                | -56                                              | -56           | -75                                                                 | -75           | 203                                              | 749                | 72                                                                  | 382                | 120                             | --                | 1000                             |
| Dissolved Copper       | mg/L       | 0.001                     | 0.001                              | 0.345                                          | 0.119                                               | 0.5868   | 0.1176             | 61 671                                           | 61 671        | 12 274                                                              | 12 274        | 70                                               | 392                | -66                                                                 | -2                 | 0.002                           | 0.3               | 0.1                              |
| Fluoride               | mg/L       | 0.130                     | 0.130                              | 0.326                                          | 0.171                                               | 0.25     | 0.26               | 95                                               | 95            | 96                                                                  | 96            | -22                                              | 48                 | -22                                                                 | 49                 | 0.12                            | --                | --                               |
| Hardness               | mg CaCO3/L | 210                       | 210                                | 247                                            | 96                                                  | 817      | 834                | 289                                              | 289           | 297                                                                 | 297           | 231                                              | 749                | 238                                                                 | 766                | --                              | --                | --                               |
| Dissolved Lead         | mg/L       | 0.0011                    | 0.0011                             | 0.0002                                         | 0.0001                                              | 0.0001   | 0.0001             | -89                                              | -89           | -92                                                                 | -92           | -49                                              | -7                 | -65                                                                 | -35                | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel       | mg/L       | 0.002                     | 0.002                              | 0.007                                          | 0.003                                               | 0.1343   | 0.0997             | 6 616                                            | 6 616         | 4 885                                                               | 4 885         | 1 713                                            | 4 181              | 1 246                                                               | 3 077              | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium       | mg/L       | 0.027                     | 0.027                              | 0.025                                          | 0.012                                               | 0.0501   | 0.0292             | 86                                               | 86            | 8                                                                   | 8             | 104                                              | 336                | 19                                                                  | 153                | --                              | --                | --                               |
| Dissolved Cadmium      | mg/L       | 0.000                     | 0.000                              | 0.000                                          | 0.000                                               | 0.0000   | 0.0000             | -80                                              | -80           | -80                                                                 | -80           | -94                                              | -90                | -94                                                                 | -90                | 0.00004                         | --                | 0.002                            |
| Dissolved Iron         | mg/L       | 0.250                     | 0.250                              | 0.167                                          | 0.063                                               | 0.0050   | 0.0050             | -98                                              | -98           | -98                                                                 | -98           | -97                                              | -92                | -97                                                                 | -92                | 0.3                             | --                | --                               |
| Dissolved Mercury      | mg/L       | 0.0000                    | 0.0000                             | 0.0000                                         | 0.0000                                              | 0.00001  | 0.00001            | 120                                              | 120           | 28                                                                  | 28            | -58                                              | -28                | -75                                                                 | -58                | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese    | mg/L       | 0.1300                    | 0.1300                             | 0.1145                                         | 0.0648                                              | 0.0245   | 0.0168             | -81                                              | -81           | -87                                                                 | -87           | -79                                              | -62                | -85                                                                 | -74                | 0.23                            | --                | --                               |
| Dissolved Molybdenum   | mg/L       | 0.0086                    | 0.0086                             | 0.1195                                         | 0.0421                                              | 0.0808   | 0.0552             | 839                                              | 839           | 541                                                                 | 541           | -32                                              | 92                 | -54                                                                 | 31                 | 0.073                           | --                | --                               |
| Dissolved Selenium     | mg/L       | 0.0002                    | 0.0002                             | 0.0217                                         | 0.0075                                              | 0.0326   | 0.0205             | 16 221                                           | 16 221        | 10 150                                                              | 10 150        | 50                                               | 333                | -6                                                                  | 172                | 0.001                           | --                | --                               |
| Dissolved Thallium     | mg/L       | 0.0000                    | 0.0000                             | 0.0015                                         | 0.0009                                              | 0.0001   | -                  | 400                                              | 400           | -                                                                   | -             | -93                                              | -88                | -                                                                   | -                  | 0.0008                          | --                | --                               |
| Nitrate                | mg/N/L     | 4.0                       | 4.0                                | 2.0                                            | 0.7                                                 | 3.96     | 2.66               | -1                                               | -1            | -34                                                                 | -34           | 102                                              | 464                | 35                                                                  | 278                | 2.94                            | --                | 20                               |
| Sulphate               | mg/L       | 21                        | 21                                 | 819                                            | 290                                                 | 824      | 561                | 3 822                                            | 3 822         | 2 571                                                               | 2 571         | 1                                                | 184                | -32                                                                 | 93                 | 128                             | --                | --                               |
| Total dissolved solids | mg/L       | 670                       | 670                                | 884                                            | 335                                                 | 1316     | 1006               | 96                                               | 96            | 50                                                                  | 50            | 49                                               | 293                | 14                                                                  | 200                | --                              | --                | --                               |
| Dissolved Zinc         | mg/L       | 0.0051                    | 0.0051                             | 0.0040                                         | 0.0025                                              | 0.0005   | 0.0005             | -90                                              | -90           | -90                                                                 | -90           | -88                                              | -80                | -88                                                                 | -80                | 0.013                           | 0.5               | 0.4                              |

**Third Portage Pit Sumps Water Quality Year 11 (Pit E)**

| Parameters             | Units      | Probable Scenario Year 4* | Possible Poor end Scenario Year 4* | Annual Average Water Quality Forecast Value*** | Lower 25% Centile Water Quality Forecasted Value*** | Measured |                    | % Difference between predicted vs measured- mean |               | % Difference between predicted vs measured- Lower 25th percentile * |               | % Difference between predicted vs measured- mean |                    | % Difference between predicted vs measured- Lower 25th percentile * |                    | CCME Guidelines**               | MMER Schedule 4** | Water License Discharge to 3PL** |
|------------------------|------------|---------------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------|----------|--------------------|--------------------------------------------------|---------------|---------------------------------------------------------------------|---------------|--------------------------------------------------|--------------------|---------------------------------------------------------------------|--------------------|---------------------------------|-------------------|----------------------------------|
|                        |            |                           |                                    |                                                |                                                     | Mean     | Lower 25th centile | Probable                                         | Possible Poor | Probable                                                            | Possible Poor | Annual Average                                   | Lower 25th centile | Annual Average                                                      | Lower 25th centile | Long Term, Based on 3PL quality | Max. Monthly Mean | Max. Avg. Conc.                  |
| pH                     |            | 6.3                       | 6.1                                |                                                |                                                     | 8.11     | 8.02               | 29                                               | 33            | 27                                                                  | 31            |                                                  |                    |                                                                     |                    | 6.5 to 9.0                      | 6.0 to 9.5        | 6.0 to 9.0                       |
| Alkalinity             | mg CaCO3/L | 40                        | 43                                 | 164                                            | 87                                                  | 87       | 85                 | 117                                              | 102           | 113                                                                 | 98            | -47                                              | -1                 | -48                                                                 | -3                 | --                              | --                | --                               |
| Ammonia (unionized)    | mg N/L     | 0.0005                    | 0.0006                             |                                                |                                                     | 0.49     | 0.17               | 94 772                                           | 89 597        | 31 631                                                              | 29 900        |                                                  |                    |                                                                     |                    | 0.016                           | --                | --                               |
| Ammonia nitrogen       | mg N/L     | 2                         | 4                                  | 22                                             | 11                                                  | 14.82    | 7.85               | 606                                              | 324           | 274                                                                 | 124           | -32                                              | 32                 | -64                                                                 | -30                | 1.83                            | --                | 16                               |
| Dissolved Arsenic      | mg/L       | 0.002                     | 0.068                              | 1.296                                          | 0.664                                               | 0.5592   | 0.3607             | 23 200                                           | 722           | 14 929                                                              | 430           | -57                                              | -16                | -72                                                                 | -46                | 0.005                           | 0.5               | 0.3                              |
| Chloride               | mg/L       | 620                       | 630                                | 148                                            | 78                                                  | 149.03   | 100.90             | -76                                              | -76           | -84                                                                 | -84           | 1                                                | 90                 | -32                                                                 | 29                 | 120                             | --                | 1000                             |
| Dissolved Copper       | mg/L       | 0.001                     | 0.016                              | 1.161                                          | 0.595                                               | 0.1742   | 0.0996             | 12 339                                           | 988           | 7 016                                                               | 523           | -85                                              | -71                | -91                                                                 | -83                | 0.002                           | 0.3               | 0.1                              |
| Fluoride               | mg/L       | 0.190                     | 0.240                              | 0.393                                          | 0.235                                               | 0.34     | 0.32               | 79                                               | 42            | 66                                                                  | 31            | -14                                              | 45                 | -20                                                                 | 34                 | 0.12                            | --                | --                               |
| Hardness               | mg CaCO3/L | 300                       | 310                                | 1581                                           | 812                                                 | 989      | 949                | 230                                              | 219           | 216                                                                 | 206           | -37                                              | 22                 | -40                                                                 | 17                 | --                              | --                | --                               |
| Dissolved Lead         | mg/L       | 0.0016                    | 0.0076                             | 0.0022                                         | 0.0011                                              | 0.00009  | 0.00009            | -95                                              | -99           | -95                                                                 | -99           | -96                                              | -92                | -96                                                                 | -92                | 0.001                           | 0.2               | 0.1                              |
| Dissolved Nickel       | mg/L       | 0.003                     | 0.093                              | 0.042                                          | 0.021                                               | 0.3899   | -                  |                                                  |               |                                                                     |               |                                                  |                    |                                                                     |                    | 0.025                           | 0.5               | 0.2                              |
| Dissolved Barium       | mg/L       | 0.041                     | 0.063                              | 0.261                                          | 0.135                                               | 0.0596   | 0.0439             | 45                                               | -5            | 7                                                                   | -30           | -77                                              | -56                | -83                                                                 | -68                | --                              | --                | --                               |
| Dissolved Cadmium      | mg/L       | 0.000                     | 0.000                              | 0.000                                          | 0.000                                               | 0.0000   | 0.0000             | -82                                              | -95           | -87                                                                 | -96           | -85                                              | -69                | -89                                                                 | -77                | 0.00004                         | --                | 0.002                            |
| Dissolved Iron         | mg/L       | 0.370                     | 4.600                              | 2.492                                          | 1.280                                               | 0.01     | 0.01               | -99                                              | -100          | -99                                                                 | -100          | -100                                             | -100               | -100                                                                | -100               | 0.3                             | --                | --                               |
| Dissolved Mercury      | mg/L       | 0.0000                    | 0.0001                             | 0.0000                                         | 0.0000                                              | 0.00001  | 0.00001            | 13                                               | -88           | -15                                                                 | -91           | -72                                              | -49                | -79                                                                 | -62                | 0.000026                        | --                | 0.0004                           |
| Dissolved Manganese    | mg/L       | 0.1900                    | 0.6600                             | 0.1826                                         | 0.0928                                              | 0.4538   | 0.0659             | 139                                              | -31           | -65                                                                 | -90           | 148                                              | 389                | -64                                                                 | -29                | 0.23                            | --                | --                               |
| Dissolved Molybdenum   | mg/L       | 0.0130                    | 0.0130                             | 0.1293                                         | 0.0655                                              | 0.1636   | 0.1603             | 1 158                                            | 1 158         | 1 133                                                               | 1 133         | 27                                               | 150                | 24                                                                  | 145                | 0.073                           | --                | --                               |
| Dissolved Selenium     | mg/L       | 0.0003                    | 0.0012                             | 0.0046                                         | 0.0023                                              | 0.0605   | 0.0363             | 20 762                                           | 4 942         | 12 400                                                              | 2 921         | 1 224                                            | 2 487              | 694                                                                 | 1 450              | 0.001                           | --                | --                               |
| Dissolved Thallium     | mg/L       | 0.0000                    | 0.0001                             | 0.0001                                         | 0.0003                                              | 0.0001   | 0.0001             | 223                                              | -17           | 223                                                                 | -17           | -86                                              | -71                | -86                                                                 | -71                | 0.0008                          | --                | --                               |
| Nitrate                | mg/N/L     | 2.3                       | 4.0                                | 4.8                                            | 2.4                                                 | 5.2      | 4.2                | 128                                              | 31            | 82                                                                  | 5             | 9                                                | 123                | -13                                                                 | 78                 | 2.94                            | --                | 20                               |
| Sulphate               | mg/L       | 31                        | 46                                 | 2909                                           | 1491                                                | 1407     | 1275               | 4 438                                            | 2 958         | 4 013                                                               | 2 672         | -52                                              | -6                 | -56                                                                 | -14                | 128                             | --                | --                               |
| Total dissolved solids | mg/L       | 960                       | 990                                | 3760                                           | 1936                                                | 717      | 79                 | -25                                              | -28           | -92                                                                 | -92           | -81                                              | -63                | -98                                                                 | -96                | --                              | --                | --                               |
| Dissolved Zinc         | mg/L       | 0.0076                    | 0.0850                             | 0.0039                                         | 0.0023                                              | 0.001    | 0.001              | -93                                              | -99           | -93                                                                 | -99           | -87                                              | -78                | -87                                                                 | -78                | 0.013                           | 0.5               | 0.4                              |

| North Portage Pit Sumps Water Quality Year 11 (Pit A) |            |                              |                                          |                                                      |                                                                 |          |                       |                                                     |               |                                                                           |               |                                                        |                          |                                                                           |                       |                                       |                         |                                        |
|-------------------------------------------------------|------------|------------------------------|------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------|----------|-----------------------|-----------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|--------------------------------------------------------|--------------------------|---------------------------------------------------------------------------|-----------------------|---------------------------------------|-------------------------|----------------------------------------|
| Parameters                                            | Units      | Probable Scenario<br>Year 4* | Possible Poor end<br>Scenario<br>Year 4* | Annual Average Water<br>Quality Forecast<br>Value*** | Lower 25%<br>Centile Water<br>Quality<br>Forecasted<br>Value*** | Measured |                       | % Difference between<br>predicted vs measured- mean |               | % Difference between<br>predicted vs measured- Lower<br>25th percentile * |               | % Difference between<br>predicted vs measured-<br>mean |                          | % Difference between<br>predicted vs measured-<br>Lower 25th percentile * |                       | CCME<br>Guidelines**                  | MMER<br>Schedule<br>4** | Water License<br>Discharge to<br>3PL** |
|                                                       |            |                              |                                          |                                                      |                                                                 | Mean     | Lower 25th<br>centile | Probable                                            | Possible Poor | Probable                                                                  | Possible Poor | Annual<br>Average                                      | Lower<br>25th<br>centile | Annual<br>Average                                                         | Lower 25th<br>centile | Long Term,<br>Based on<br>3PL quality | Max.<br>Monthly<br>Mean | Max. Avg<br>Conc.                      |
| pH                                                    |            | 6.3                          | 6.1                                      |                                                      |                                                                 | 8.29     | 7.90                  | 32                                                  | 36            | 25                                                                        | 30            |                                                        |                          | #DIV/0!                                                                   | #DIV/0!               | 6.5 to 9.0                            | 6.0 to 9.5              | 6.0 to 9.0                             |
| Alkalinity                                            | mg CaCO3/L | 0.05                         | 2.40                                     | 67                                                   | 58                                                              | 91       | 63                    | 182 233                                             | 3 699         | 125 900                                                                   | 2 525         | 36                                                     | 58                       | -6                                                                        | 9                     | --                                    | --                      | --                                     |
| Ammonia (unionized)                                   | mg N/L     | 0.003                        | 0.001                                    |                                                      |                                                                 | 0.3085   | 0.2625                | 10 183                                              | 21 936        | 8 650                                                                     | 18 650        |                                                        |                          |                                                                           |                       | 0.016                                 | --                      | --                                     |
| Ammonia nitrogen                                      | mg N/L     | 12                           | 9                                        | 20                                                   | 18                                                              | 13.1     | 12.9                  | 9                                                   | 47            | 8                                                                         | 45            | -34                                                    | -27                      |                                                                           |                       | 1.83                                  | --                      | 16                                     |
| Dissolved Asenic                                      | mg/L       | 0.000                        | 0.056                                    | 0.180                                                | 0.009                                                           | 0.3454   | 0.3348                | 767 419                                             | 517           | 743 956                                                                   | 498           | 92                                                     | 3 739                    | 86                                                                        | 3 622                 | 0.005                                 | 0.5                     | 0.3                                    |
| Chloride                                              | mg/L       | 0                            | 0                                        | 108                                                  | 96                                                              | 124      | 131                   | 12 698 880                                          | 49 680        | 13 400 410                                                                | 52 430        | 15                                                     | 29                       | 21                                                                        | 37                    | 120                                   | --                      | 1000                                   |
| Dissolved Copper                                      | mg/L       | 0.000                        | 0.007                                    | 0.629                                                | 0.629                                                           | 0.3274   | 0.1324                | 2 976 112                                           | 4 577         | 1 203 309                                                                 | 1 791         | -50                                                    | -48                      | -80                                                                       | -79                   | 0.002                                 | 0.3                     | 0.1                                    |
| Fluoride                                              | mg/L       | 0.000                        | 0.031                                    | 0.437                                                | 0.400                                                           | 0.25     | 0.17                  | 3 124 900                                           | 706           | 2 156 150                                                                 | 456           | -43                                                    | -37                      | -61                                                                       | -57                   | 0.12                                  | --                      | --                                     |
| Hardness                                              | mg CaCO3/L | 0                            | 8                                        | 542                                                  | 423                                                             | 610      | 608                   | 1 354 344                                           | 7 519         | 1 350 456                                                                 | 7 497         | 12                                                     | 44                       | 12                                                                        | 44                    | --                                    | --                      | --                                     |
| Dissolved Lead                                        | mg/L       | 0.0000                       | 0.0029                                   | 0.0005                                               | 0.0003                                                          | 0.0004   | 0.0001                | 17 741                                              | -86           | 3 764                                                                     | -97           | -25                                                    | 43                       | -84                                                                       | -69                   | 0.001                                 | 0.2                     | 0.1                                    |
| Dissolved Nickel                                      | mg/L       | 0.000                        | 0.043                                    | 0.015                                                | 0.012                                                           | 0.0919   | 0.0755                | 270 047                                             | 114           | 221 885                                                                   | 76            | 498                                                    | 644                      | 391                                                                       | 511                   | 0.025                                 | 0.5                     | 0.2                                    |
| Dissolved Barium                                      | mg/L       | 0.000                        | 0.013                                    | 0.065                                                | 0.038                                                           | 0.0483   | 0.0431                | 254 023                                             | 271           | 226 874                                                                   | 232           | -26                                                    | 27                       | -34                                                                       | 13                    | --                                    | --                      | --                                     |
| Dissolved Cadmium                                     | mg/L       | 0.000                        | 0.000                                    | 0.000                                                | 0.000                                                           | 0.0000   | 0.0000                | 1 567                                               | -90           | 1 567                                                                     | -90           | -91                                                    | -89                      | -91                                                                       | -89                   | 0.00004                               | --                      | 0.002                                  |
| Dissolved Iron                                        | mg/L       | 0.000                        | 2.100                                    | 0.571                                                | 0.294                                                           | 0.0167   | 0.0050                | 17 082                                              | -99           | 5 055                                                                     | -100          | -97                                                    | -94                      | -99                                                                       | -98                   | 0.3                                   | --                      | --                                     |
| Dissolved Mercury                                     | mg/L       | 0.0000                       | 0.0000                                   | 0.0000                                               | 0.0000                                                          | 0.00001  | 0.00001               | 8 829                                               | -83           | 8 829                                                                     | -83           | -74                                                    | -73                      | -74                                                                       | -73                   | 0.000026                              | --                      | 0.0004                                 |
| Dissolved Manganese                                   | mg/L       | 0.0002                       | 0.2200                                   | 0.0924                                               | 0.0827                                                          | 0.2039   | 0.1035                | 135 811                                             | -7            | 68 917                                                                    | -53           | 121                                                    | 147                      | 12                                                                        | 25                    | 0.23                                  | --                      | --                                     |
| Dissolved Molybdenum                                  | mg/L       | 0.0000                       | 0.0008                                   | 0.1863                                               | 0.1639                                                          | 0.0898   | 0.0714                | 2 243 650                                           | 10 980        | 1 785 525                                                                 | 8 718         | -52                                                    | -45                      | -62                                                                       | -56                   | 0.073                                 | --                      | --                                     |
| Dissolved Selenium                                    | mg/L       | 0.0000                       | 0.0006                                   | 0.0320                                               | 0.0248                                                          | 0.0188   | 0.0140                | 626 289                                             | 3 140         | 466 567                                                                   | 2 314         | -41                                                    | -24                      | -56                                                                       | -44                   | 0.001                                 | --                      | --                                     |
| Dissolved Thallium                                    | mg/L       | 0.0000                       | 0.0001                                   | 0.0009                                               | 0.0008                                                          | 0.0003   | 0.0001                | 18 948                                              | 368           | 7 043                                                                     | 75            | -69                                                    | -66                      | -88                                                                       | -87                   | 0.0008                                | --                      | --                                     |
| Nitrate                                               | mgN/L      | 13.0                         | 10.0                                     | 3.6                                                  | 3.3                                                             | 2.82     | 2.71                  | -78                                                 | -72           | -79                                                                       | -73           | -21                                                    | -14                      | -24                                                                       | -18                   | 2.94                                  | --                      | 20                                     |
| Sulphate                                              | mg/L       | 0                            | 9                                        | 1583                                                 | 1505                                                            | 720      | 592                   | 6 544 597                                           | 8 081         | 5 377 173                                                                 | 6 622         | -55                                                    | -52                      | -63                                                                       | -61                   | 128                                   | --                      | --                                     |
| Total dissolved solids                                | mg/L       | 28                           | 41                                       | 1710                                                 | 1542                                                            | 1120     | 1093                  | 3 898                                               | 2 630         | 3 802                                                                     | 2 565         | -35                                                    | -27                      | -36                                                                       | -29                   | --                                    | --                      | --                                     |
| Dissolved Zinc                                        | mg/L       | 0.0000                       | 0.0370                                   | 0.0039                                               | 0.0037                                                          | 0.0005   | 0.0005                | 1 463                                               | -99           | 1 463                                                                     | -99           | -87                                                    | -86                      | -87                                                                       | -86                   | 0.013                                 | 0.5                     | 0.4                                    |

**Footnotes:**  
Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.  
\* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0  
\*\* Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).  
\*\*\* Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2019, Doc. No. 662987-5000-4EER-0001, rev. 00.  
+ Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.  
Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.