**Supplemental Table 2. PHREEQC Input File.**

TITLE Pebble Pit Inputs

SOLUTION 1 Pre-Tertiary Wall Rock - Acidic

temp 16

pH 3.5

pe 4

redox pe

units mg/kgw

density 1

Al 23

Ca 9.9

Cd 0.026

Cl 6.9

Cu 6.4

Fe 39

K 0.0004

Mg 1.9

Mn 13

N(5) 0

N(-3) 0

Na 0.008

Pb 0.0081

S(6) 280

Zn 2

-water 1 # kg

END

SOLUTION 2 Tertiary Wall Rock - Non-acidic

temp 16

pH 8.2

pe 4

redox pe

units mg/kgw

density 1

Al 0.0015

Alkalinity 69 as CaCO3

Ca 25

Cd 0.00023

Cl 2.3

Cu 0.0041

Fe 0.002

K 4.7

Mg 2.5

Mn 0.14

N(5) 0

Na 9.8

Pb 0.00047

S(6) 29

Zn 0.0078

-water 1 # kg

END

SOLUTION 3 Pit area groundwater

temp 16

pH 6.7

pe 4

redox pe

units mg/kgw

density 1

Al 0.0034

Alkalinity 33 as CaCO3

Ca 14

Cd 0.00001

Cl 0.8

Cu 0.00044

Fe 0.02

K 0.34

Mg 1.1

Mn 0.44

Na 2.5

Pb 0.0001

S(6) 4.9

Zn 0.0015

-water 1 # kg

END

SOLUTION 4 SFK SK100F Non-contact surface water

temp 15

pH 6.8

pe 4

redox pe

units mg/kgw

density 1

Al 0.054

Alkalinity 18 as CaCO3

Ba 0.0049

Ca 6.1

Cd 1.3e-005

Cl 0.71

Cu 0.0021

F 0.04

Fe 0.55

K 0.37

Mg 1.5

Mn 0.049

Na 2.4

Pb 0.00028

S(6) 7.8

Zn 0.0032

-water 1 # kg

END

SOLUTION 5 PTSF Re-Slurry Water to Pit, Phase 1 Closure

temp 15

pH 3

pe 4

redox pe

units mg/kgw

density 1

Al 750

Alkalinity 14 as CaCO3

Ba 0.07

Ca 800

Cd 1.1

Cl 6.935

Cu 640

F 2.785

Fe 1800

K 140

Mg 190

Mn 56

Na 41

Pb 0.049

S(6) 31000 charge

Zn 170

-water 1 # kg

END

SOLUTION 6 WTP Sludge

temp 15

pH 7

pe 4

redox pe

units mg/kgw

density 1

Al 3

Alkalinity 0 as CaCO3

B 0.81

Ba 0.147

Ca 3232

Cd 0.19

Cl 4

Cu 1.209

F 0.31

Fe 557

K 71.6

Mg 113

Mn 13.4

N(5) 0.61

N(-3) 4.7

Na 440

Pb 0.084

S(6) 11520

Zn 8.2

-water 1 # kg

END

SOLUTION 7 WTP Reject

temp 15

pH 7

pe 4

redox pe

units mg/kgw

density 1

Al 5.55

Alkalinity 0 as CaCO3

B 7.52

Ba 6.464

Ca 11698

Cd 0.027754

Cl 0

Cu 0

F 13.7

Fe 0

K 38867

Mg 1070

Mn 1.01

N(-3) 377

N(5) 1.59

Na 30235

Pb 0

S(6) 181744

Zn 0.1998

-water 1 # kg

END

SOLUTION 8 Bulk TSF Closure Phase 2, 50th percentile

temp 15

pH 8

pe 4

redox pe

units mg/kgw

density 1

Al 0.0006

Alkalinity 327 as CaCO3

B 0.315

Ba 0.066

Ca 473

Cd 0.00634

Cl 8.16

Cu 0.01

F 0.56

Fe 0.002

K 33.4

Mg 75

Mn 1.6

Pb 0.0316

S(6) 1491

Zn 0.969

-water 1 # kg

END

SOLUTION 9 Bulk TSF Closure Phase 3, 50th percentile

temp 15

pH 8

pe 4

redox pe

units mg/kgw

density 1

Al 0.0006

Alkalinity 42 as CaCO3

B 0.021

Ba 0.008

Ca 23

Cd 0.00134

Cl 1.97

Cu 0.001

F 0.06

Fe 0.002

K 5.8

Mg 10

Mn 0.15

Na 14

Pb 0.0022

S(6) 102

Zn 0.18

N(5) 1

-water 1 # kg

END

SOLUTION 10 Bulk TSF Main Embankment SCP - Closure Phase 2, 50th percentile

temp 15

pH 8

pe 4

redox pe

units mg/kgw

density 1

Al 2.16

Alkalinity 665 as CaCO3

B 0.449

Ba 0.13

Ca 665

Cd 0.00863

Cl 8.05

Cu 0.3195

F 0.78

Fe 1.559

K 31.1

Mg 85.5

Mn 2.5

Na 112

Pb 0.0432

S(6) 2029

Zn 1.641

-water 1 # kg

END

MIX 1 Open Pit Mix - Years 1 - 105 of Closure

1 0.175

2 0.019

3 0.16

4 0.086

5 0.201

6 0.0247

7 0.0023

8 0.032

9 0.279

10 0.022