



4.1-9

✓

## Internal Memorandum

**To:** Stephen Day (SRK)  
**From:** Greg Williams, Miguel Wong  
**Subject:** Water Quality Estimates for LTVSMC Tailings Basin Cell 2E and Cell 2W Seepage  
**Date:** February 8, 2008  
**Project:** 23/69-862-015-074  
**c:** John Borovsky

This memo presents the recalculation of the "Seepage Return" parameter concentrations (originally presented in Table 4.1, RS54/RS46) using 2007 data in addition to data provided in RS64.

We understand the Agencies had some questions about the source data used to determine the "Seepage Return" water quality characterization presented in Table 4.1, RS54/RS46. The data used by SRK was derived from RS64 for the period August 1999 through October 2005, but it was not specified in the report what sampling locations were included to represent the water quality for each the LTVSMC Tailings Basin Cell 2E seepage and the Cell 2W seepage. On the other hand, water quality data obtained in 2007 has become available. Therefore, "Seepage Return" concentrations have been recalculated with this new information as detailed below.

Water quality data collected between 1999 and 2007 exists for multiple locations in and around the tailings basin. Data from the following locations were grouped to characterize seepage water quality from Cell 2W: GW-001 and SD-002. Data from the following locations were grouped to characterize seepage water quality from Cell 2E: GW-003, GW-004, GW-005, GW-006, GW-007, GW-008, SD-001, SD-004, SD-006, the West Side Seep, WS-011, WS-012, and WS-013. All data were given equal weight. As a result, locations with more frequent sampling have a greater influence on calculated statistics. Non-detections were included in the analysis as a concentration equivalent to the detection limit; non-detections were not consistently accounted for in the calculations supporting the values presented in Table 4.1, RS54/RS46. The following statistics were computed for each parameter for Cells 2E and Cell 2W:

- Number of data points (n)
- Minimum concentration

To: Stephen Day (SRK)  
 From: Greg Williams, Miguel Wong  
 Subject: Water Quality Estimates for LTVSMC Tailings Basin Cell 2E and Cell 2W Seepage  
 Date: February 8, 2008  
 Project: 23/69-862-015-074  
 Page: 2

---

- 5<sup>th</sup> percentile concentration
- Median concentration
- Mean concentration
- 95<sup>th</sup> percentile concentration
- Maximum concentration

These statistics for selected water quality parameters are included in Table 1 for Cell 2E seepage and in Table 2 for Cell 2W seepage. The statistics for all water quality parameters are presented in Excel file attached to this memo.

**Table 1: Seepage water quality calculations for Cell 2E – selected parameters**

Statistic	Cobalt (total) µg/L	Copper (total) µg/L	Hardness (CaCO <sub>3</sub> ) µg/L	Nickel (total) µg/L	Sulfate mg/L	Zinc (total) µg/L
Minimum	<1	<1	107.00	<2	8.10	<10
P5	<1	<1	365.50	<2	51.62	<10
Median	<1	2.00	524.00	<2	165.00	<10
Mean	1.28	2.39	506.12	2.15	173.03	10.05
P95	1.63	3.58	648.90	2.40	304.00	10.26
Maximum	16.80	24.20	763.00	5.90	473.00	10.40

**Table 2: Seepage water quality calculations for Cell 2W – selected parameters**

Statistic	Cobalt (total) µg/L	Copper (total) µg/L	Hardness (CaCO <sub>3</sub> ) µg/L	Nickel (total) µg/L	Sulfate mg/L	Zinc (total) µg/L
Minimum	<1	<1	230.00	<2	19.90	<10
P5	<1	<1	258.25	<2	50.16	<10
Median	<1	2.00	494.00	<2	173.00	<10
Mean	1.41	3.07	488.19	3.49	192.84	11.53
P95	3.00	8.07	792.75	10.71	349.20	25.00
Maximum	8.00	38.70	828.00	45.80	531.00	25.00