

| To:   | Nicola Banton                  | From: | Peter Reid                              |
|-------|--------------------------------|-------|---|
|       | KGHM Ajax Mine<br>Kamloops, BC |       | Stantec Consulting Ltd.<br>Kamloops, BC |
| File: | 123510762                      | Date: | March 29, 2016                          |

# Reference: Response to MEMO NUMBER SLR021

Key items from the memo:

- 1. Requesting CALPOST files
- 2. Requesting more information on the OLM method
- 3. Clarification for choice of 2003 vs 2004 as worst case year

## **Responses:**

1. It was stated that the reviewer was unable to verify CALPUFF model outputs since CALPOST input and output files were not provided. CALPOST is a post-processor created by the CALPUFF model development team that reads the output files created by the CALPUFF model and produces tabulations based upon user selected species, averaging periods and percentiles. Separate CALPOST input and output files need to be created to extract summary statistics from each scenario, each contaminant and for various averaging periods resulting in numerous input and output files. As a result, it is common for air quality experts to create post-processing software that more efficiently automates the creation of input files, running of the post-processing software, tabulation of output and plotting of figures. Commercial software providers of "user friendly" versions of CALPUFF such as Lake Environment CALPUFF View do the same thing.

The post-process of CALPUFF output for the AJAX Project was similarly automated, by-passing manual creation and running of CALPOST. CALPOST input and output files were not provided as they do not exist. However, all CALPUFF model output files have been provided to the reviewer and the reviewer was encouraged to setup and run CALPOST to verify model outputs.

As the reviewer has indicated that running CALPOST lies outside their scope of work a sample modelling "how to" package will be developed that will step through the modelling exercise start to finish. This package will be discussed in a small meeting (date yet to be determined) between the Stantec modelers and the SLR modelers.

2. The OLM method is described in section 4.4.2 of Appendix 10.1-A.

The CALPUFF model was run to calculate NO<sub>X</sub> concentrations. As the CALPUFF model does not include an option to apply the OLM method internal to the model run, it is necessary to complete the ozone limiting method (OLM) was applied as a subsequent post-processing step to convert all predicted NO<sub>X</sub> concentrations at all receptors and for all hours to NO<sub>2</sub> concentrations. As the amount of data to which it is necessary to apply the OLM conversion is very large, a custom-post processor was developed that reads in the CALPUFF NO<sub>X</sub> concentration data and calculates a corresponding NO<sub>2</sub> concentration dataset.



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All hourly NOX concentrations are converted to  $NO_2$  using a time-varying  $O_3$  dataset. Hourly  $O_3$  for the modelling period is from the Kamloops Brocklehurst monitoring station. The hourly  $O_3$  was provided to SLR. The implementation of the OLM method for this project is exactly the same as the OLM code contained within the AERMOD model and is consistent with both the model plan and BC Modelling Guidelines.

All predicted NO<sub>x</sub> and NO<sub>2</sub> concentration datasets have been provided to the reviewer along with the time-varying ozone dataset to allow the reviewer to independently apply the OLM calculations and verify the accuracy of the calculations.

3. The reviewer has indicated that model predictions for the year 2004 appear to be larger than the year 2003 for some chemicals and averaging periods.

The selected year of meteorological data was determined based upon Stantecs understanding that the purpose of the air quality assessment is to predict the maximum potential effects on air quality associated with the Project that occur on and beyond the plant boundary. An objective analysis of the Project Alone Case model predictions for each year meteorological data was completed to determine which year results in maximum predicted effects on air quality associated with emissions from the Project (i.e. focus on the Project Case). The reviewer notes in the question that the year 2004 does contain some higher predictions than the 2003 results, however the example provided in the reviewers question are associated with Base Case model results, not the Project Alone Case. In addition, the reviewer has provided examples indicating concentration predictions in 2004 are greater than 2003; however, has focused on model predictions within the development boundary of the mine itself and not along or outside of the plant boundary.

A review of project case model predictions along or outside of the plant boundary indicates that maximum predicted concentrations occur in the year 2003. As a result, consistent with the approved model plan, the year 2003 was selected as the basis for the air quality assessment.

## Stantec Consulting Ltd.

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