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Memorandum

To: Todd Powell, Director, Mineral Resources, Energy, Mines and Resources
From: Hecla Yukon
CC: Keno City Residents
Date: 7/11/2023
Re: 2022 Q4 Air Quality Monitoring Report

INTRODUCTION

This report summarizes air quality monitoring results for Hecla Yukon Keno Hill during the fourth quarter of 2022. A detailed air quality monitoring summary report for 2022 was submitted as an Appendix to the Quartz mining License annual report in April 2023. It was requested by EMR on 7/10/2023 that a quarterly report also be submitted in addition to the 2022 detailed summary report. The following information is being submitted to satisfy that request from EMR.

Addressing the potential effects of fugitive dust on community health and well-being is of key importance given the location of the Keno Hill Silver District Mine Operations to Keno City. The primary dust sources in the proximity of the village of Keno City include the dry stack tailings facility, mineral processing (crushing) and mine traffic on unpaved roads.

Hecla Yukon Keno Hill monitors dust levels in the Keno City area using BGI Omni Ambient Air Quality Samplers. Dust or particulate matter (PM) is divided into different sized fractions for air quality monitoring. Hecla Yukon Keno Hill collects for three filter inlet sizes (TSP, PM10 and PM2.5) at each air quality monitoring station which is then sent to an analytical laboratory for gravimetric analysis. Metals analyses by Inductively Coupled Plasma (ICP) mass spectrometry are conducted on the total suspended particulate (TSP) sample.

Particulate air quality monitoring results are compared to the Yukon Ambient Air Quality Standards. Yukon does not have ambient air quality standards for metals, as a result the Ontario Ministry of Environment Ambient Air Quality Criteria 24-hr average concentrations for metals is used to assess metals of concern (arsenic, cadmium, iron, manganese, lead, and zinc).

The company also maintains a Dust Disturbance Register to record, track and address dust disturbance concerns raised by Keno City residents.

RESULTS

The data used to evaluate air quality during the fourth quarter of 2022 was collected at three monitoring locations, TSP-1, TSP-2, and TSP-3. All samples with the exception of PM₁₀ concentration in one sample collected at TSP-2 and TSP-1, met the Yukon Ambient Air Quality Standards and the Ontario Ambient Air Quality Criteria. The results for the parameters of concern are compared to the Yukon and Ontario thresholds on Table 1.

As well, no complaints were filed or recorded by area residents in the Dust Disturbance Register.

Table 1: Concentrations Summary for 2022 Q4 (24-hour)

	TSP	PM10	PM2.5	As	Cd	Fe	Pb	Mn	Zn
Air Quality Criteria (ug/m3)	120	50	27	0.3	0.025	4	0.5	0.4	120
Station	TSP-1								
Average	8.7	4.7	6.5	0.00049	0.00012	0.078	0.00443	0.004	0.0118
Count	15	14	14	16	16	16	16	16	16
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.021	0.00035	0.001	0.0035
Maximum	15.7	14.9	25.8	0.00256	0.00031	0.244	0.01153	0.009	0.0407
Geometric Mean	7.4	3.8	4.6	0.0004	0.0001	0.067	0.00323	0.003	0.0093
Count Exceeding Standard (Q3)	0	0	0	0	0	0	0	0	0
Station	TSP-2								
Average	8.9	16.8	5.3	0.00037	0.00016	0.081	0.00392	0.005	0.0134
Count	16	13	14	16	16	16	16	16	16
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.021	0.00078	0.002	0.0035
Maximum	18.9	151.4	17.9	0.00072	0.00058	0.261	0.01819	0.017	0.0265
Geometric Mean	7.2	5.7	4.2	0.00037	0.0001	0.061	0.00292	0.004	0.0115
Count Exceeding Standard (Q3)	0	1	0	0	0	0	0	0	0
Station	TSP-3								
Average	9.6	11.8	5.7	0.00035	0.0001	0.061	0.00322	0.003	0.0076
Count	17	14	14	17	17	17	17	17	17
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.021	0.00035	0.001	0.0035
Maximum	16.5	88.6	16.8	0.00035	0.00025	0.175	0.0175	0.009	0.02
Geometric Mean	7.5	5.5	4.4	0.00035	0.00009	0.054	0.00226	0.003	0.0062
Count Exceeding Standard (Q3)	0	1	0	0	0	0	0	0	0

CONCLUSION

The data used to evaluate air quality during the fourth quarter of 2022 was collected at three monitoring locations, TSP-1, TSP-2, and TSP-3. All samples with the exception of PM₁₀ concentration in one sample collected at TSP-2 and TSP-1, met the Yukon Ambient Air Quality Standards and the Ontario Ambient Air Quality Criteria. Exceedances observed in 2022 coincide with local forest fires or significantly colder weather in 2022.

REFERENCES

Ontario Ministry of Environment. (2012). Ontario's Ambient Air Quality Criteria. Standards Development Branch. PIBS#6570e01. April 2012.

Yukon Environment. (2019). Yukon Ambient Air Quality Standards. April 2010, updated October 2019.