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Memorandum

To: Todd Powell, Director, Mineral Resources, Energy, Mines and Resources
From: Hecla Yukon
CC: Keno City Residents
Date: 7/8/2023
Re: 2023 Q1 Air Quality Monitoring Report

INTRODUCTION

This report summarizes air quality monitoring results for Hecla Yukon Keno Hill during the first quarter of 2023.

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 first quarter of 2023 was collected at three monitoring locations, TSP-1, TSP-2, and TSP-3. All samples with the exception of the lead concentration in the sample that was collected on January 23, 2023, met the Yukon Ambient Air Quality Standards and the Ontario Ambient Air Quality Criteria. The lead concentration in the sample collected on January 23, 2023, was above the air quality criteria. All other parameters for that sample were well below the air quality criteria. The sample is being considered an anomaly since all the other parameters were well below the air quality criteria and the lead concentrations for the samples collected on January 22 and January 30 were 0.00103 ug/m3 and 0.00314 ug/m3, respectively, which is well below the January 23 lead sample result. 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 2023 Q1 (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	3.1	2.8	2.8	0.00035	0.00017	0.078	0.00538	0.004	0.0078
Count	14	10	7	15	15	15	15	15	15
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.043	0.00035	0	0.0035
Maximum	6.7	2.8	2.8	0.00035	0.00043	0.207	0.01958	0.013	0.0243
Geometric Mean	3	2.8	2.8	0.00035	0.00013	0.07	0.0033	0.003	0.0062
Count Exceeding Standard (Q3)	0	0	0	0	0	0	0	0	0
Station	TSP-2								
Average	2.8	2.8	2.8	0.00035	0.00009	0.067	0.0077	0.004	0.0136
Count	12	6	6	12	12	12	12	12	12
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.049	0.00126	0.001	0.0035
Maximum	2.8	2.8	2.8	0.00035	0.00021	0.097	0.02917	0.011	0.0207
Geometric Mean	2.8	2.8	2.8	0.00035	0.00008	0.065	0.00494	0.003	0.0119
Count Exceeding Standard (Q3)	0	0	0	0	0	0	0	0	0
Station	TSP-3								
Average	4.4	6.7	2.8	0.00106	0.00167	0.192	0.06724	0.011	0.036
Count	16	12	13	16	16	16	16	16	16
Minimum	2.8	2.8	2.8	0.00035	0.00007	0.021	0.00085	0.001	0.0035
Maximum	24.4	45.6	2.8	0.01117	0.01958	2	1.00139	0.121	0.4889
Geometric Mean	3.4	3.8	2.8	0.00046	0.00019	0.078	0.00439	0.004	0.0064
Count Exceeding Standard (Q3)	0	0	0	0	0	0	1	0	0

CONCLUSION

The data used to evaluate air quality during the first quarter of 2023 was collected at three monitoring locations, TSP-1, TSP-2, and TSP-3. All samples with the exception of the lead concentration in the sample that was collected on January 23, 2023, met the Yukon Ambient Air Quality Standards and the Ontario Ambient Air Quality Criteria. The dust abatement and monitoring program will continue at Hecla Yukon Keno Hill throughout the year.

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.