



2021 ANNUAL REPORT

QUARTZ MINING LICENSE QML-0009

March 2022

Prepared for:

YUKON GOVERNMENT - ENERGY, MINES AND RESOURCES

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1 INTRODUCTION

Alexco Keno Hill Mining Corp. (AKHM) was issued Quartz Mining License (QML) QML-0009 on November 17, 2009. This document serves to fulfill the annual reporting requirement for AKHM QML 0009 for 2021.

Alexco Resource Corp. (Alexco), AKHM's parent company, has been actively developing the Keno Hill Silver District (KHSD) since 2006. The KHSD quartz mining claims and quartz mining leases are held by one of two wholly-owned subsidiaries of Alexco: Elsa Reclamation & Development Company Ltd. (ERDC) or (AKHM) (except for holding a 50% share with third party individuals in three leases).

The KHSD has a long mining history and is a brownfields site. Care and maintenance and interim reclamation of the historic liabilities is undertaken by ERDC. AKHM develops the mineral resources of the KHSD.

On August 20, 2010, a Type A Water Licence was issued to AKHM for operation of the Bellekeno Mine and District Mill. On September 7, 2010, the Bellekeno Mine became a "mine under development" as defined in subsection 2(1) and subsection 2(2) of the federal *Metal and Diamond Mining Effluent Regulations (MDMER)* under the Fisheries Act. The District Mill was constructed in 2010 and operated for three years, processing material from the Bellekeno Mine. Mining operations were suspended in 2013, and Alexco maintained the KHSD on a care and maintenance status and focused on additional exploration which led to increases in the estimated mineral resources for the Birmingham and Flame & Moth deposits. Phased underground development of these deposits commenced in 2018 and included a new portal and ramp at the Birmingham deposit, and a new portal and ramp at the Flame & Moth deposit. Underground development activities resumed at Birmingham and Flame & Moth in Q3 of 2020. In Q4 of 2020 production from Bellekeno resumed and the District Mill returned to operation. On November 30, 2020, the Flame & Moth Mine became a "mine under development" in accordance with the *MDMER*. AKHM began shipping concentrate in Q1 2021.

1.1 LOCATION AND ACCESS

The KHSD is located in the central Yukon approximately 350 km north of Whitehorse, Yukon Territory, Canada. The area is covered by NTS map sheets 105M/14. The Bellekeno, Birmingham and Flame & Moth deposits are within the KHSD, as is shown in Figure 1-1. The Bellekeno East Portal is located at UTM 7087062 N, 487363 E Zone 8, NAD83. The New Birmingham Portal is located at UTM 7087233 N 478607 E Zone 8, NAD 83. The Flame & Moth Portal is located at UTM 7086787 N, 484002E Zone 8, NAD 83.

Access to the property is via the Alaska, Klondike and Silver Trail highways from Whitehorse to the Village of Mayo (407 km), and an all-weather gravel road northeast from Mayo to Elsa (45 km); a total distance of 452 km. The closest sizable town for services is Mayo, which is located on the Stewart River, approximately 40 km to the southwest of the KHSD. The Village of Mayo is also serviced by the Mayo airport, which is located just to the north of the town. The Silver Trail Highway leads from Village of Mayo to the KHSD, the historic company town of Elsa, and the community of Keno City (Figure 1-2).

1.2 MAJOR PERMITS AND REGULATORY CONTEXT

The Bellekeno, Birmingham, and Flame & Moth mines have all permits and authorizations in place for mine production. The existing approvals and assessments for exploration, mining activities, and for ERDC care and maintenance activities are summarized in Table 1-1.

Table 1-1: Relevant Assessment and Regulatory Approvals

Purpose	YESAA Approval	Quartz Mining Act Approval	Water Use Licence
Alexco Keno Hill Mining Corp. Permits			
Bellekeno Advanced Exploration	Project #2008-0039 Decision Document	Class 4 Mining Land Use Approval (LQ00476, expires 2028)	Type B Water Use Licence QZ07-078/Amendment 1 QZ10-060, licence cancelled in 2015. Replaced by amended type A Water Licence in 2015 ²
Birmingham Advanced Exploration	Project#2017-0086 Decision Document	Class 4 Mining Land Use Approval (LQ00476, expires 2028)	Schedule 3 Notice of Water Use/Deposit of a Waste without a Licence
Bellekeno Mine Production	Project #2009-0030 Decision Document	Quartz Mining Licence (QML-0009, Amendment 2, expires 2037) ¹	Type A Water Use Licence QZ18-044, expires 2037 ²
Onek 990 and Lucky Queen Mine Production	Project#2011-0315 Decision Document	Quartz Mining Licence (QML-0009, Amendment 2, expires 2037) ¹	Use of water and the deposit of waste into water is not authorized
Flame & Moth Mine Production	Project #2013-0161 Decision Document	Quartz Mining Licence (QML-0009, Amendment 2, expires 2037) ¹	Type A Water Use Licence QZ18-044, expires 2037 ²
Birmingham Mine Production	Project#2017-0176 Decision Document	Quartz Mining Licence (QML-0009, Amendment 2, expires 2037) ¹	Type A Water Use Licence QZ18-044 issued, Expires 2037 ²
Elsa Reclamation and Development Company Ltd. Permits			
Care and Maintenance	Project #2006-0293 and 2012-0141	N/A	Type B Water Use Licence QZ17-076 expires 2022 ²
Reclamation Plan	Project #2011-0187 Decision Document (land treatment facility) Project #2012-0077 Decision Document (building demolition) Project #2018-0169 Decision Document (Reclamation Plan implementation)	N/A	Submitted application QZ21-012 to Water Board following issuance of YESAB Decision Document for Project #2018-0169
Notes			
https://emr-ftp.gov.yk.ca/emrweb/COMM/major-mines/keno-hill/mml-keno-qml-0009-nov2019.pdf http://www.yukonwaterboard.ca/waterline/			



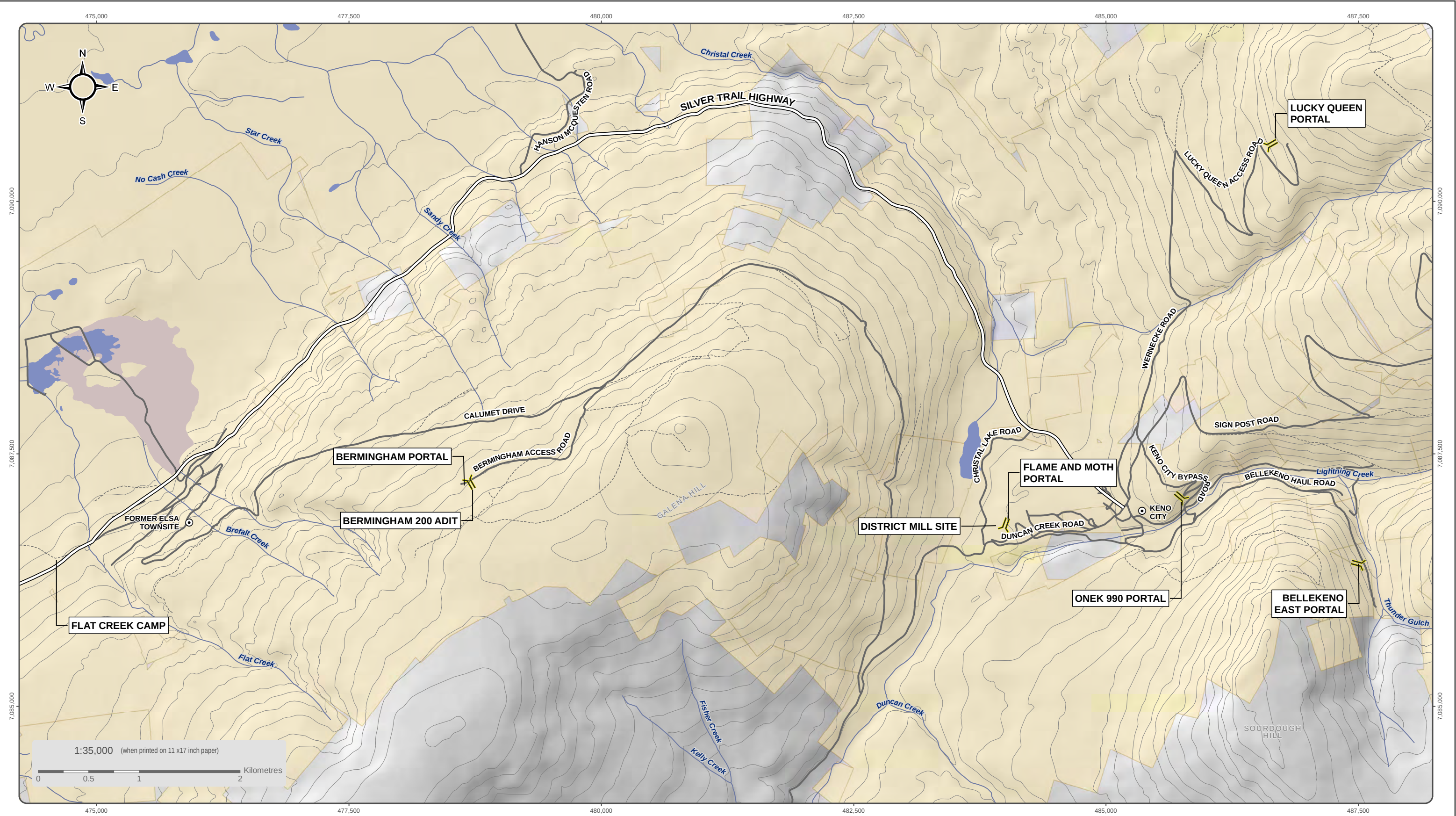
ALEXCO KENO HILL MINING CORP.
2021 ANNUAL REPORT QUARTZ MINING LICENSE
QML-0009

FIGURE 1-1 PROJECT LOCATION

MARCH 2022

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National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Cadastral data compiled by Natural Resources Canada. Reproduced under license from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.

Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2021

Datum: NAD 83; Map Projection: UTM Zone 8N

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- | | | |
|---------------------------|---------------|----------------------|
| Place of Interest | Tailings Area | Silver Trail Highway |
| Adit | Waterbody | Road |
| Alexco/ERDC Quartz Claims | Watercourse | Limited-Use Road |



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FIGURE 1-2
KENO HILL SILVER DISTRICT MINING
OPERATIONS OVERVIEW

MARCH 2021

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2 MINING ACTIVITIES

2.1 MINE SITES

2.1.1 Bellekeno

The Bellekeno Mine is located on the northern flank of Sourdough Hill, about 3 km east of Keno City. In 2008, Alexco undertook the development of a new ramp to access the central area of the historic Bellekeno Mine, also referred to as Bellekeno East, and the rehabilitation of the Bellekeno 625 Adit. AKHM commenced production in 2011. Underground development at Bellekeno was placed under temporary closure in September 2013 and no mining activities occurred in 2014 to 2019. In 2020, dewatering commenced in Q2 and mine production resumed in Q4. Mine production ceased Q4 2021.

The site infrastructure remaining at Bellekeno East includes the warehouse containers, surface laydown area and a decommissioned fuel tank. In 2021, the miners' office buildings with septic storage, and miners' dry was removed, and the potentially-acid metal leaching (P-AML) waste rock storage facility decommissioned. The maintenance shop was removed in 2020. Photo 2-1 shows the surface facilities that existing in 2018.

Water discharge from the Bellekeno Mine is treated at the Bellekeno 625 Adit water treatment facility. This effluent is discharged to ground prior to reaching Lightning Creek. The propane tank was removed in 2021. The green sea container was removed prior to 2021 seen in Photo 2-2.



Photo 2-1: Bellekeno East Portal Surface Facilities from 2018.



Photo 2-2: Bellekeno 625 Adit Surface Facilities from 2018.

2.1.2 Flame & Moth

The Flame & Moth Mine is located adjacent to the existing mill and administration facilities. The mill facilities and associated mine surface infrastructure is shown on Figure 2-1. The Flame & Moth portal was established in 2016. Ramp development was undertaken in 2018 and resumed in 2020. Waste rock generated was non-acid metal leaching (N-AML) and used for construction around the mill area or placed in the N-AML waste rock facility. No ore was produced in 2021.

The Flame & Moth Mine utilizes surface infrastructure at the District Mill site. Additional infrastructure for the mine consists of:

- a miners' office trailer and miners' dry facility;
- P-AML waste rock facility;
- N-AML waste rock facility;
- portal ventilation fan and heater;
- air compressors;
- clarifier inside the District Mill for water treatment; and
- the Flame & Moth settling pond.

Emergency egress and ventilation for the Flame & Moth Mine will be provided through a vent raise driven to surface approximately 150 m south of the crusher. Mine discharge is pumped from the underground and treated on surface before release into the receiving environment.

FIGURE 2-1

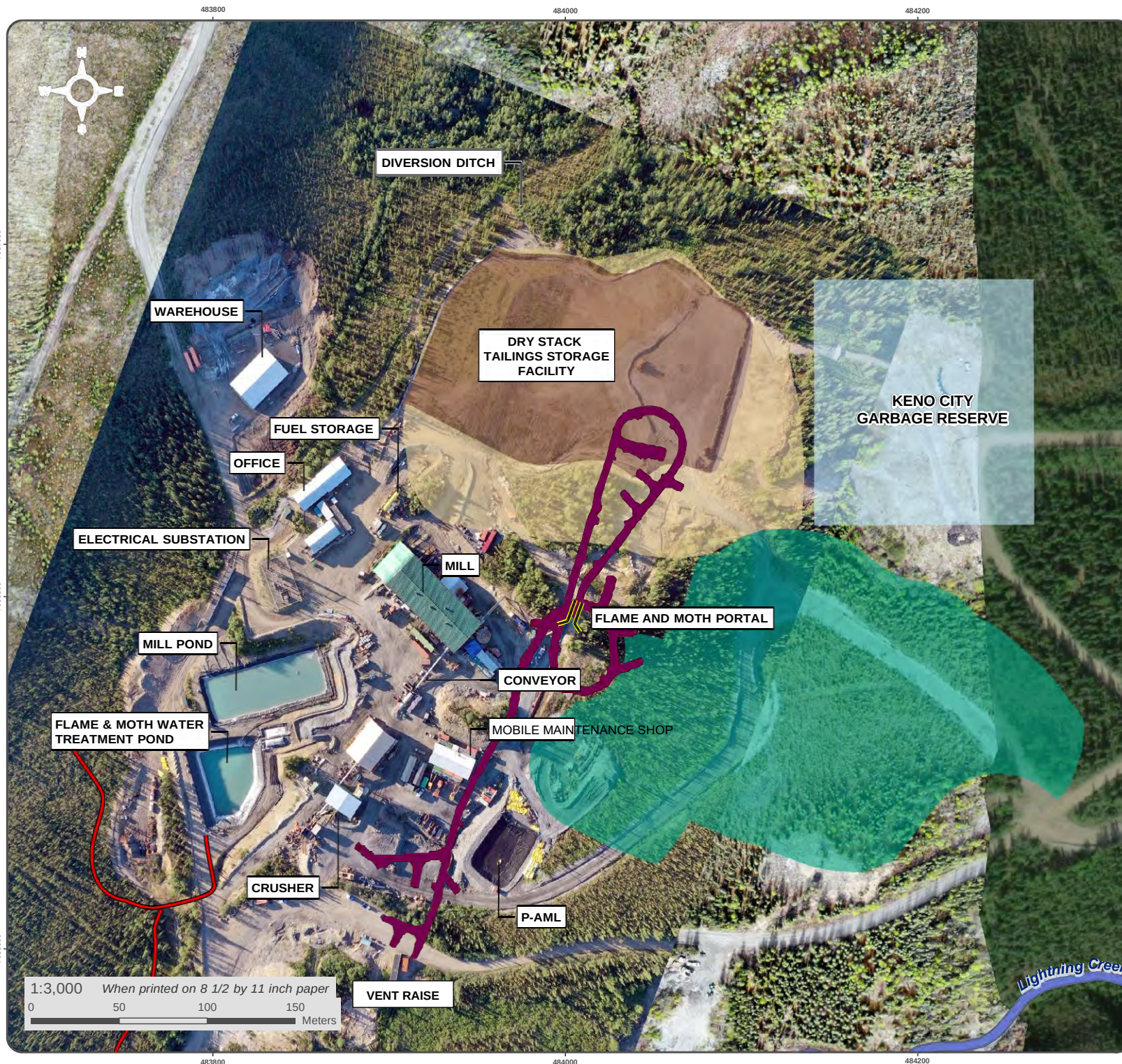
DISTRICT MILL AND
FLAME AND MOTH LAYOUT

March 2022

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7086000



-  Adit
-  Pipeline
-  Decline
-  Waterbody
-  Land Disposition
-  DSTF 322k Tonnes Design
-  Current DSTF
-  Permitted To Be Constructed Features

Aerial Imagery acquired on August, 2020.

Datum: NAD 83; Map Projection: UTM Zone 8N

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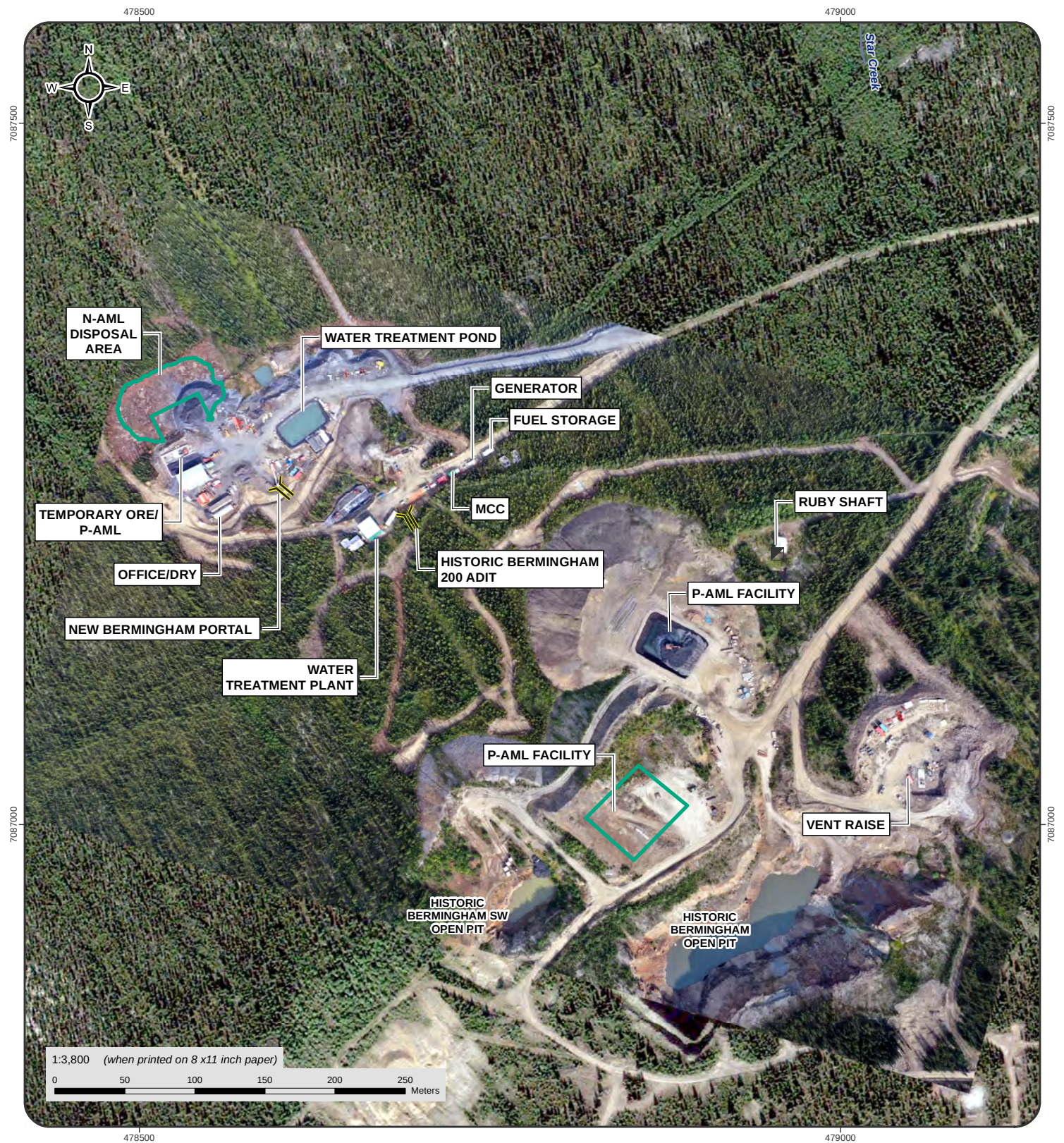
2.1.3 New Bermingham

The New Bermingham Mine is located approximately 4 km from the mill underneath the historical Bermingham Pit. In 2017 the New Bermingham portal was collared and included the development of the ramp to undertake an underground exploration drill program. Underground development resumed in Q3 2020, and ore production commenced in Q3 2021.

The surface infrastructure constructed for the advanced exploration ramp was expanded to facilitate development and production at the New Bermingham Mine in 2020 and with new facilities constructed/commissioned in 2021 as described in Section 4.1. The surface infrastructure at the New Bermingham Mine consists of:

- a miners' office trailer and miners' dry facility;
- mobile maintenance garage;
- temporary ore and P-AML storage pad;
- portal ventilation fan and heater;
- air compressors;
- warehouse containers;
- diesel fuel facility;
- backup generators;
- P-AML waste rock facility;
- ventilation raise and primary fan and heater;
- sludge disposal pit (historic Bermingham SW Pit);
- N-AML waste rock facility; and
- water treatment facility.

The layout of the New Bermingham Mine and associated surface infrastructure is shown on Figure 2-2 and in oblique view in Photo 2-3 and Photo 2-4. The Ruby Power Station was brought online in 2021 to connect the Bermingham mine to the regional power grid.



- Permitted To Be Constructed Mine Features
- Surface Watercourse

- Y Adit/Portal
- Shaft



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FIGURE 2-2

**NEW BIRMINGHAM MINE
 LAYOUT**

MARCH 2022

Satellite imagery obtained from ESRI ArcGIS map service <https://services.arcgis.com/arcgis/rest/service> on November 18 2021.

Datum: NAD 83; Projection: UTM Zone 8N

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 (Last edited by: losberg: 11/18/2021/11:05 AM)



Photo 2-3: Bermingham Surface View from September 2021.



Photo 2-4: Bermingham Vent Raise View from August 2021.

2.1.4 Lucky Queen



Photo 2-5: Lucky Queen Surface View from 2018.

There have been no mining or development activities at Lucky Queen 2014 to 2021. The existing Lucky Queen portal pad, developed on a historic waste dump, will be used to support mining operations at Lucky Queen. The existing surface infrastructure includes a shop and office as seen in Photo 2-5.

2.1.5 Onek 990

There have been no mining or development activities at Onek 990 from 2014 to 2021. Photo 2-6 shows the surface view for the Onek 990 Mine.



Photo 2-6: Onek 990 Surface view from 2018.

2.2 LIFE OF MINE AND RESERVES

Alexco issued the results of a Pre-Feasibility Study (PFS) for the Keno Hill Silver project in April 2019, which was then replaced with the current report, entitled *NI 43-101 Technical Report on Updated Mineral Resource and Reserve Estimate of the Keno Hill Silver District* (Mining Plus Canada, 2021).

The mine plan comprises mining from the Bermingham, Flame & Moth, Bellekeno, and Lucky Queen mines. The majority of the mill feed (over 94%) will come from Bermingham and Flame & Moth deposits. The Bellekeno reserves were mined out in 2021 and entered a temporary closure period. Although the Lucky Queen mine is included in the PFS, it is not currently in the Alexco Life of Mine (LOM) plan until it is authorized with a water use licence.

The estimated Mineral Resources for the KHSD includes the Bellekeno, Lucky Queen, Flame & Moth, Onek 990, and Bermingham deposits. The total estimated Mineral Resources inclusive of estimated Probable Mineral Reserves is shown in Table 2-1.

Table 2-1: Mineral Resources as of January 01, 2021

Category	Tonnes (t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag (oz)
Indicated	3,826,800	596	0.34	2.1	5.4	73,352,000
Inferred	1,719,600	442	0.2	1.4	3.9	24,413,000

Notes:

1. All Mineral Resources are classified following the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014) of NI 43-101.
2. Indicated Mineral Resources are inclusive of Probable Mineral Reserves estimates.
3. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. All numbers have been rounded to reflect the relative accuracy of the estimates.
4. The Mineral Resource estimates comprising Lucky Queen and Flame & Moth, Onek and Bermingham are supported by disclosure in the news release dated March 28, 2019 entitled "Alexco Announces Positive Pre-Feasibility Study for Expanded Silver Production at Keno Hill Silver District" and the Technical Report filed on SEDAR dated February 13, 2020 with an effective date of March 28, 2019.
5. The Mineral Resource estimate for the Bermingham deposit is based on Mineral Resource estimates having an effective date of March 28, 2019.
6. The Mineral Resource estimate for the Lucky Queen, Flame & Moth and Onek deposits have an effective date of January 3, 2017.
7. The Mineral Resource estimate for the Bellekeno deposit is based on an internal Mineral Resource estimate completed by Alexco Resource Corp. and externally audited by SRK Consulting Inc., having an effective date of January 01, 2021. This Mineral Resource estimate has been depleted to reflect all mine production from Bellekeno to the end of December 2020.

The estimated Probable Mineral Reserves are 1.44 Mt grading 804 g/t Ag, 2.64% Pb, 3.84% Zn and 0.31 g/t Au for an overall Ag equivalent (AgEq) grade of 1,035 g/t as of April 1, 2021 (Mining Plus Canada 2021). Ore production at Flame & Moth mine will occur over 8.0 years at an average rate of 245 tonnes per day (tpd). Bermingham will produce ore for 7.0 years at an average rate of 270 tpd. As the Bermingham mine ramps down, the Lucky Queen mine will begin development to supplement ore feed to the mill. The Lucky Queen mine will produce ore for 1.7 years at an average rate of 115 tpd.

The Mineral Reserves for the KHSD are shown in Table 2-2. All Mineral Reserves are Probable Mineral Reserves. External dilution and mineable recovery has been applied to the Mineral Reserves.

Table 2-2: Mineral Reserves as of May 26, 2021

Deposit ³	Category	Tonnes	Ag (g/t)	Pb (%)	Zn (%)	Au (g/t)	Contained Metal			
							Ag (000 oz)	Au (000 oz)	Pb (M lbs)	Zn (M lbs)
Bellekeno	Proven	-	-	-	-	-				
	Probable	12,809	936	13.00	7.30	0	385	0	4	2
Bellekeno Surface Stockpile	Proven									
	Probable	3,397	1150	21.70	4.50	0	126	0	2	0
Lucky Queen	Proven	-	-	-	-	-	-		-	-
	Probable	70,648	1,269	2.71	1.56	0.13	2,883	0	4	2
Flame & Moth	Proven	-	-	-	-	-	-		-	-
	Probable	721,322	672	2.69	6.21	0.49	15,590	11	43	99
Birmingham	Proven	-	-	-	-	-	-		-	-
	Probable	630,173	899	2.26	1.30	0.13	18,209	3	31	18
Total	Proven	-	-	-	-	-	-		-	-
	Probable	1,438,349	804	2.64	3.84	0.31	37,193	14	84	122
Notes: 1. Mineral Reserves are reported herein based on a net smelter return cutoff value using estimated metallurgical recoveries, assumed metal prices and smelter terms, which include payable factors, treatment charges, penalties, and refining charges. 2. Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces. 3. The Bellekeno, Lucky Queen, Flame & Moth and Birmingham deposits are incorporated into the current mine plan supported by disclosure in the news release dated May 26, 2021 entitled "Alexco Announces 22% Increase to Silver Reserves; Updated Technical Report Demonstrates Robust Economics at Keno Hill". 4. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content.										

2.3 MINING METHODOLOGY

The Keno Hill Silver District (KHSD) project contains four separate deposits: Bellekeno, Birmingham, Flame & Moth, and Lucky Queen. There are currently no plans to bring the Onek 990 deposit into production. All four deposits will be mined by mechanized underground mining methods of cut and fill and longhole stoping with cemented rock fill and unconsolidated rock fill. In the wider areas of the orebody, a Drift and Fill method with cemented rock fill will be used. Longhole stoping will be either standard longitudinal retreat with cemented rock fill or uphole stoping with no fill. Longhole stoping will be used where the ground conditions and ore body dip allow, or to recover sill pillars below cut and fill levels. These mining methods were chosen due to the narrow steeply dipping nature of the orebody and to maximize safety and productivity.

Longhole stoping was the method used to mine the remaining ore at Bellekeno. The Flame & Moth deposit will be mined by mechanized underground mining methods of cut and fill and longhole stoping with cemented rock fill and unconsolidated rock fill. In 2021, ore was extracted from the Birmingham Mine from development of the 1150 LH undercut, as well as initial blasting of the 1150 LH stope. Mining of ore did not occur at the Flame & Moth Mine in 2021.

2.4 DEVELOPMENT

2.4.1 Bellekeno

In 2021, 18,142 tonnes of ore were produced at the Bellekeno Mine. No development was completed in 2021. Dewatering of the mine and effluent discharge from the water treatment facility ceased October 15, 2021. The Bellekeno Mine was put on temporary closure November 15, 2021. As-built drawings for the Bellekeno underground workings can be seen in Figure 2-3.

2.4.2 Flame & Moth

Activities at Flame & Moth in 2021 included development of the first two production levels, 835 and 815, as follows:

- 478.6 m of lateral underground development;
- 224 m ramp development;
- 150 m level access development;
- 20 m sump development;
- 15 m remuck development;
- 43 m ventilation drive development; and
- 27 m other infrastructure development.

The 815 alimak nest (storage bay for the alimak machine) was established and the fresh air raise was advanced two (2) m. The surface area required for the ventilation raise was cleared and the ground prepared.

A total of 24,554 tonnes of N-AML waste rock was generated in 2021 and used for construction around the mill area. No ore was produced and no P-AML waste rock generated in 2021. Figure 2-4 shows the as-built drawing for the Flame & Moth underground workings. commenced.

In 2022, the mine development and ore production will continue, as will mine water management. Production of ore commenced in Q1 of 2022. Regular maintenance will continue to support safe production for this and subsequent years. Improvements and optimization of the mine water management and water treatment will continue to be evaluated, as mining proceeds and mine water inflows increase.

2.4.3 New Bermingham

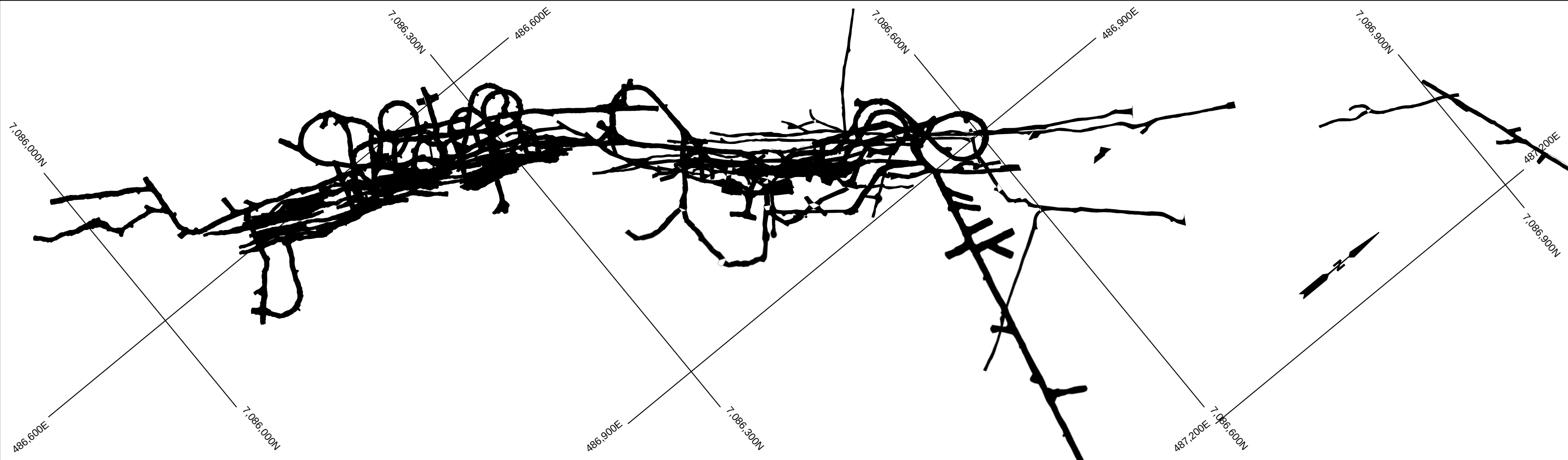
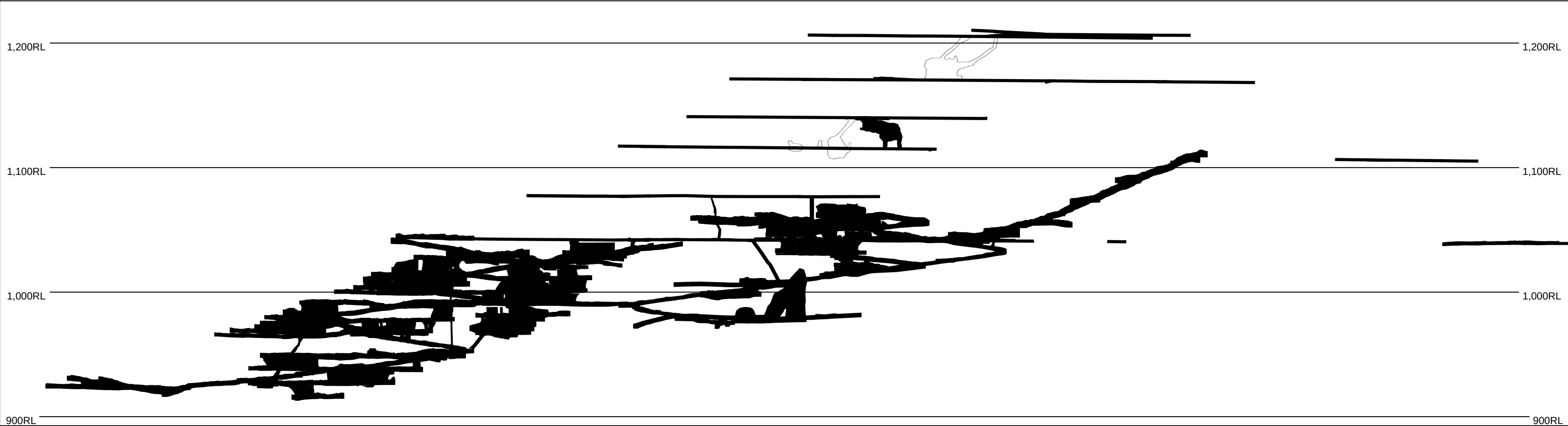
In 2021, 5,868 tonnes of ore were produced; mine development and production generated 24,886 tonnes of N-AML waste rock that was placed on surface to expand the portal pad, and 3,966 tonnes of P-AML waste rock that was relocated to the Bermingham P-AML waste rock storage area.

At the Bermingham Mine in 2021 there was 464 m of lateral development as follows:

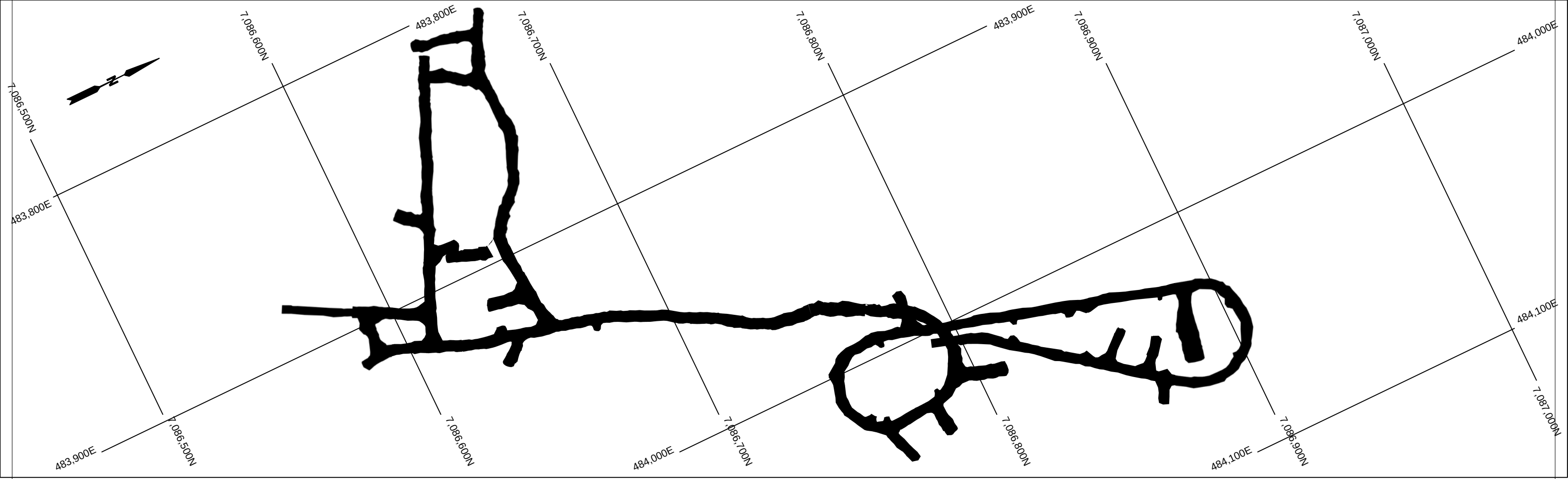
- 288 m ramp development;
- 119 m level access development to the 1150 longhole stope;
- 48 m remuck development was 48 m; and
- 9 m other infrastructure development.

The 153 m fresh air ventilation raise was completed in 2021. Figure 2-5 shows the as-built drawing for the Bermingham underground workings.

In 2022, the mine development and ore production will continue, as will mine water management. Regular maintenance will continue to support safe production for this and subsequent years. Improvements and optimization of the mine water management and water treatment will continue to be evaluated, as mining proceeds and mine water inflows increase.



	Revision Comments	Approvals						FIGURE 2-3 BELLEKENO MINE AS BUILT (END OF 2021) QUARTZ MINING LICENSE QML-0009			
		Name	chopkins								
		Signed									
		Date	2022-03-27					Scale: 1:3000	Dwg Z: 0.0	Rev #: 0	Mine:Bellekeno
			Originator	Engineering	Geology	Mine Superintendent	Mine / Ops Manager	File Path:	T:\ 01 Deswik Model\ 2.6 - (UG) Survey\ Bellekeno\ G_BK.dcf		



	Revision Comments	Approvals						FIGURE 2-4 FLAME AND MOTH AS BUILT (END OF 2021) QUARTZ MINING LICENSE QML-0009			
		Name	chopkins								
		Signed									
		Date	2022-03-27					Scale: 1:1500	Dwg Z: 0.0	Rev #: 0	Mine:Flame and Moth
			Originator	Engineering	Geology	Mine Superintendent	Mine / Ops Manager	File Path: T:\01 Deswik Model\ 2.6 - (UG) Survey\ Flame & Moth\ S_FM_MAR.duf			

3 MILLING OPERATIONS

3.1 ORE PROCESSING

The District Mill is designed for 400 tpd mill throughput. The milling is based on a conventional sequential flotation process producing lead and zinc concentrates. Ore is crushed and then processed in a conventional flotation mill producing two concentrates: a silver/lead concentrate, and a zinc concentrate. Concentrates are thickened, filtered, and trucked off site for sale. Tailings are also thickened, filtered, and stored in a dry stack tailing facility (DSTF) adjacent to the mill.

Process water is be stored in the Mill Pond adjacent to the mill complex and recycled to the plant for milling. Excess water in the Mill Pond can be discharged to the Christal Creek drainage basin if required. Make-up process water is obtained from treated effluent from the Flame & Moth Mine water treatment plant if required.

Mill operations resumed in Q4 2020 with the commissioning of the District Mill. A stockpile of 5,100 tonnes of ore remained to be processed at the mill at the end of 2020. Shipping of concentrate began in January 2021. The amount of ore milled and its grade along with the concentrate produced in 2021 is shown in Table 3-1.

Table 3-1: 2021 Concentrate Production and Grades

Year	Mill Feed (dmt)	Head Grade			Conc. Trucked (dmt)	
		Ag (g/t)	Pb (%)	Zn (%)	Pb-Ag Conc	Zn Conc
2021	29,112	720	8.5	3.9	3,103	1,568
Note: Source March 21, 2022 https://www.alexcoresource.com/site/assets/files/6621/2021-03-21-alexco-nr.pdf						

3.2 TAILINGS

Approximately 24,435 tonnes of tailings were generated from Bellekeno (20,120 tonnes) and New Bermingham (4,315 tonnes) and placed in phase 1 of the DSTF in 2021.

3.3 ASSOCIATED INFRASTRUCTURE

The Flat Creek camp facilities include a trailer camp, kitchen facility, welcoming centre and dry. In addition, there are four refurbished houses located nearby the townsite of Elsa and a bunkhouse. The entire capacity of the camp facilities (effective December 31, 2021) is 172 rooms.

The withdraw of water from Flat Creek and an existing groundwater well is authorized under WL QZ18-044. Wastewater treatment consist of septic tanks which discharge through sewer lines into absorption beds at the Flat Creek Camp (Permit #3448) and adjacent to the Elsa houses (Permit #3449).

4 CONSTRUCTION ACTIVITIES

4.1 MINE INFRASTRUCTURE

In 2021, the foundation for the Flame & Moth ventilation raise and nearby propane tank was prepared. At Bermingham surface construction activities included the construction of the temporary ore and P-AML waste rock storage area; completion of one of two P-AML waste rock storage facilities, completion of the Bermingham vent raise and associated primary fan and heater and installation of a nearby propane tank. The mine was connected to the regional electrical power grid in Q3 2021. The Bermingham water treatment plant was upgraded to include an ammonia treatment plant and to allow the treatment of arsenic.

4.2 ROAD CONSTRUCTION

In 2021 Calumet Drive between the Bermingham Haul Road and the Duncan Creek Road was improved to safely accommodate ore haulage trucks. Improvements included grading and construction of run-away lanes, berms and widening to allow areas for light vehicles to pull off. No major upgrades occurred on the roads to Lucky Queen, Christal Lake Road, Keno City to Bellekeno Haul Road Bypass, or the Bellekeno Haul Road in 2021. Standard maintenance occurred throughout the year.

4.3 MILL SITE CONSTRUCTION

In 2021, a second office and dry facility were commissioned along with a warehouse and yard adjacent to the District Mill. The enclosure of the secondary crusher building was completed and a new building to protect regrind mills from the elements constructed.

Ditches and culverts at the mill yard continued to be maintained to facilitate channeling melt water in the spring and storm events into sediment basins. Organics from the construction of the warehouse yard were either stockpiled or used on the DSTF.

4.4 DRY STACK TAILINGS FACILITY

In 2021, liner was laid for the placement of tailings in accordance with the phase 1 DSTF design. Maintenance of the ditches and sumps were made in preparation for winter. Additional maintenance activities were completed in response to recommendations from the annual geotechnical inspection (see Section 6.1.4).

4.5 FLAT CREEK (ELSA) CAMP UPGRADES

The welcome center at the Flat Creek Camp was commissioned in 2021. Other upgrades included: the replacement and relocation of the propane tank; additional fire protection; and the demolition of an abandoned structure.

In 2020, Permit 81-012 was amended to operate an incinerator at Elsa to meet the requirements of the QML-0009 Schedule C item 2.6 (b). The commissioning of the incinerator commenced in January 2021. The incinerator was damaged and required repairs prior to the completion of the commissioning. The repairs were completed in September 2021. The stack emission testing and final commissioning will be in June 2022.

4.6 UPCOMING MAINTENANCE AND UPGRADES

4.6.1 Mill Upgrades and Maintenance

In 2022, routine maintenance of the mill will continue. The capacity of the zinc and lead regrind circuit is to be upgraded to improve recovery.

Geotechnical studies and detailed engineering design for phase 2 of the DSTF is scheduled to be conducted in 2022. Routine maintenance of diversion channels, ditches and the sump will continue. Fresh tailings will continue to be covered with overburden to reduce erosion and the surface of the DSTF monitoring for erosional features and repaired as necessary.

4.6.2 Mine Upgrades and Maintenance

4.6.2.1 Bellekeno

Water treatment and maintenance of safe access to the Bellekeno Mine will continue for 2022. On-going routine monitoring and maintenance of the site infrastructure and facilities will continue until mining recommences or full closure is initiated.

Gate and fencing of access to the underground workings will be established in 2022. Waste in the laydown yard and at the mine portal will be removed and equipment salvaged.

Sludge will be removed from the Bellekeno 625 water treatment ponds, and the adjacent bermed decant area relocated underground in the Bellekeno Mine.

4.6.2.2 Flame & Moth

Production of ore commenced in January 2022. Regular maintenance will continue to support safe production for this and subsequent years. The fresh air ventilation raise will be completed which will include fan installation and a permanent propane heater.

4.6.2.3 Bermingham

In 2022, the mine ramp development, level development and mining will continue. Regular maintenance will continue to support safe production for this and subsequent years. A waste oil burner is to be commissioned in the mobile maintenance shop in 2022.

5 WASTE MANAGEMENT

5.1 TAILINGS MANAGEMENT

Tailings were placed in the DSTF as directed in the *DSTF Operation, Maintenance, and Surveillance Manual (OMS)*, which forms part of the *DSTF Construction and Operation Plan*. Geotechnical investigation is required to advance the phase 2 DSTF design. An update of the OMS Manual will be required to incorporate the findings of the investigation in support of the detailed design of the expansion.

The *Tailings Characterization Plan* provides a method by which the geochemical and physical characteristics of tailings generated by the District Mill are evaluated. Revision 6 of this plan was submitted in October 2021 and approved December 2021.

5.2 WASTE ROCK MANAGEMENT

Waste rock was managed at the site in accordance with the *Waste Rock Management Plan*. Revision 6.5 of this plan was submitted in October 2021 and approved December 2021. Updates to the plan included completed to-date and plans for further kinetic testing, saturated column testing for backfill material and waste rock storage facility design criteria. AKHM is currently preparing Revision 6.6 of the plan to reflect operational experience gained throughout 2021. Field screening criteria will be emphasized, and the methodology used to composite samples and track results based on rock unit distribution included.

No waste rock was generated at Bellekeno in 2021. Non-acid metal leaching (N-AML) waste rock from New Birmingham and Flame & Moth was deposited in the adjacent N-AML waste rock facility or used for construction around the New Birmingham Portal and District Mill area, respectively. Potentially-acid metal leaching (P-AML) waste rock from New Birmingham was placed at the P-AML waste storage facility. All waste rock brought to surface was identified as N-AML or P-AML based on field screening criteria developed for the individual deposits. Additionally, all the P-AML waste rock that was in the Bellekeno temporary P-AML waste rock storage facility was relocated underground at Bellekeno in 2021.

5.3 SLUDGE MANAGEMENT

The *Sludge Management Plan* was updated in October 2020 as required by WL QZ18-044. The updates included the deposition of sludge into the tailings thickener in the District Mill, the Birmingham Southwest open pit and underground at Bellekeno, and a plan to remove sludge previously deposited in the Valley Tailings Bellekeno Sludge Storage Area.

6 MONITORING

6.1 MONITORING AND SURVEILLANCE PLAN

Site environmental monitoring was carried out at the site in accordance with the *Monitoring and Surveillance Plan*. A revision to the Plan was submitted in October 2021 and approved December 2021. The updated plan included monitoring and surveillance to reflect requirements of WL QZ18-044 and also to reflect updates to dust, noise, and waste rock monitoring.

If monitoring indicates that physical structures, treatment systems or mitigative measures are not performing, then maintenance or contingency plans can be implemented following an adaptive management approach

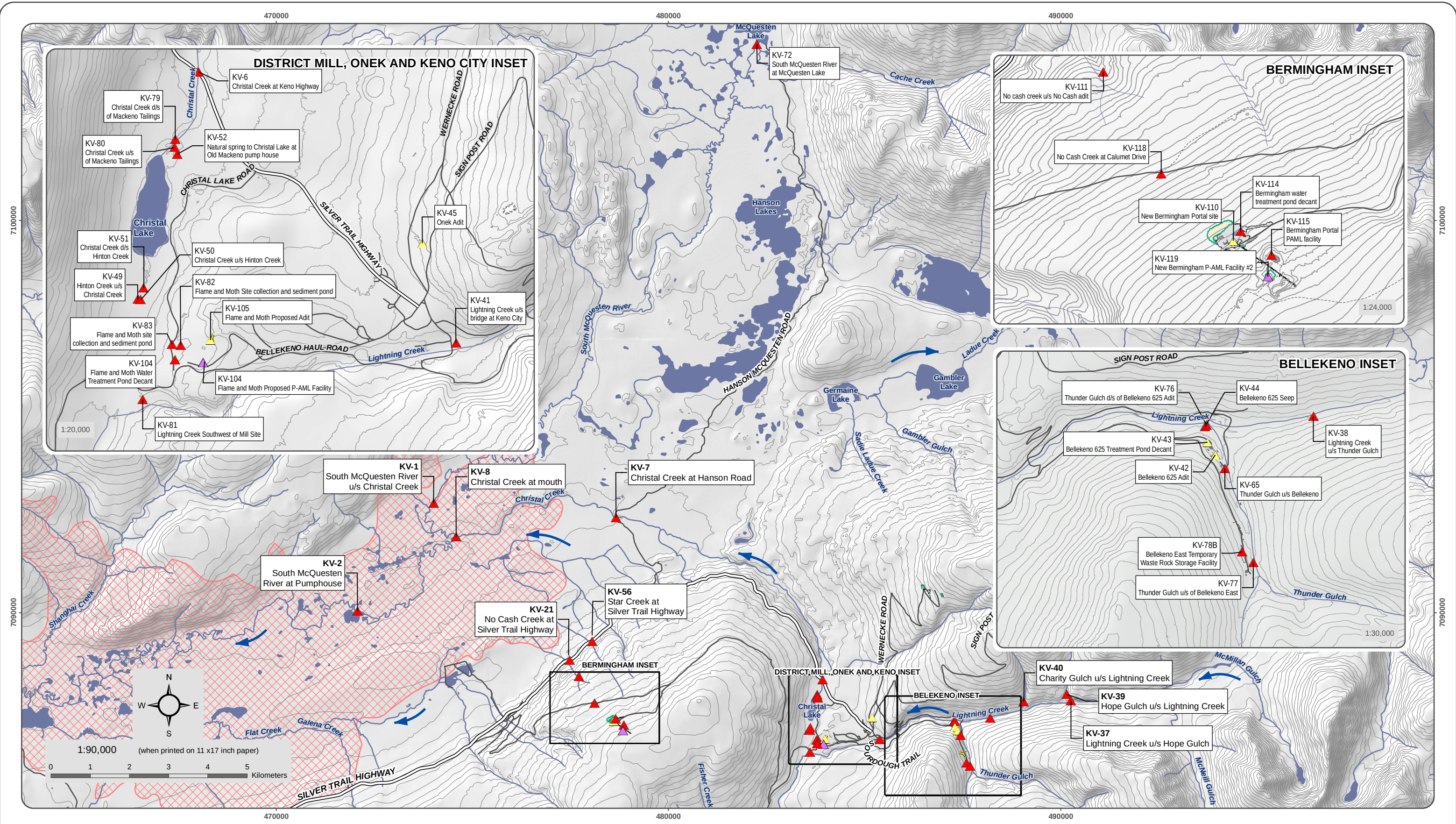
6.1.1 Water Quality Surveillance Network

AKHM WL QZ18-044 provides Effluent Quality Standards which dictate maximum concentrations of specific parameters allowed to be discharged from the Bellekeno, Flame & Moth, New Bermingham and the District Mill water treatment systems. In addition to the monitoring of treated effluent discharge; discharge from associated adits, seepage from waste rock storage facilities, background surface water stations upstream of facilities are monitored along with the receiving environment.

The water quality monitoring locations, parameters to be tested and the frequency of testing are provided in Schedule B, WL QZ18-044 along with stream flow and water level monitoring requirements.

Groundwater wells are scheduled for monthly monitoring for both water level and quality after installation for the first twelve months; followed by quarterly sampling thereafter. Additional monitoring wells were installed in 2020. WL QZ18-044 surface and groundwater monitoring locations are shown on Figure 6-1 and Figure 6-2.

As part of evaluation of the data environmental models are updated with the water quality and quantity information including groundwater models, water quality models, water balances and water quality objectives. Water quality data are compared with established thresholds and AMP triggers as part of the routine review. Results can be seen in the WL QZ18-044 2021 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).



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- Adit Water Quality Station
- Surface Water Quality Station
- Pending Water Quality Stations
- Adit
- As Built Mine Structure
- Permitted To Be Constructed Mine Features
- 2019 Forest Fire Extent
- Surface Water Flow Direction
- Silver Trail Highway
- Other Road
- Watercourse
- Waterbody

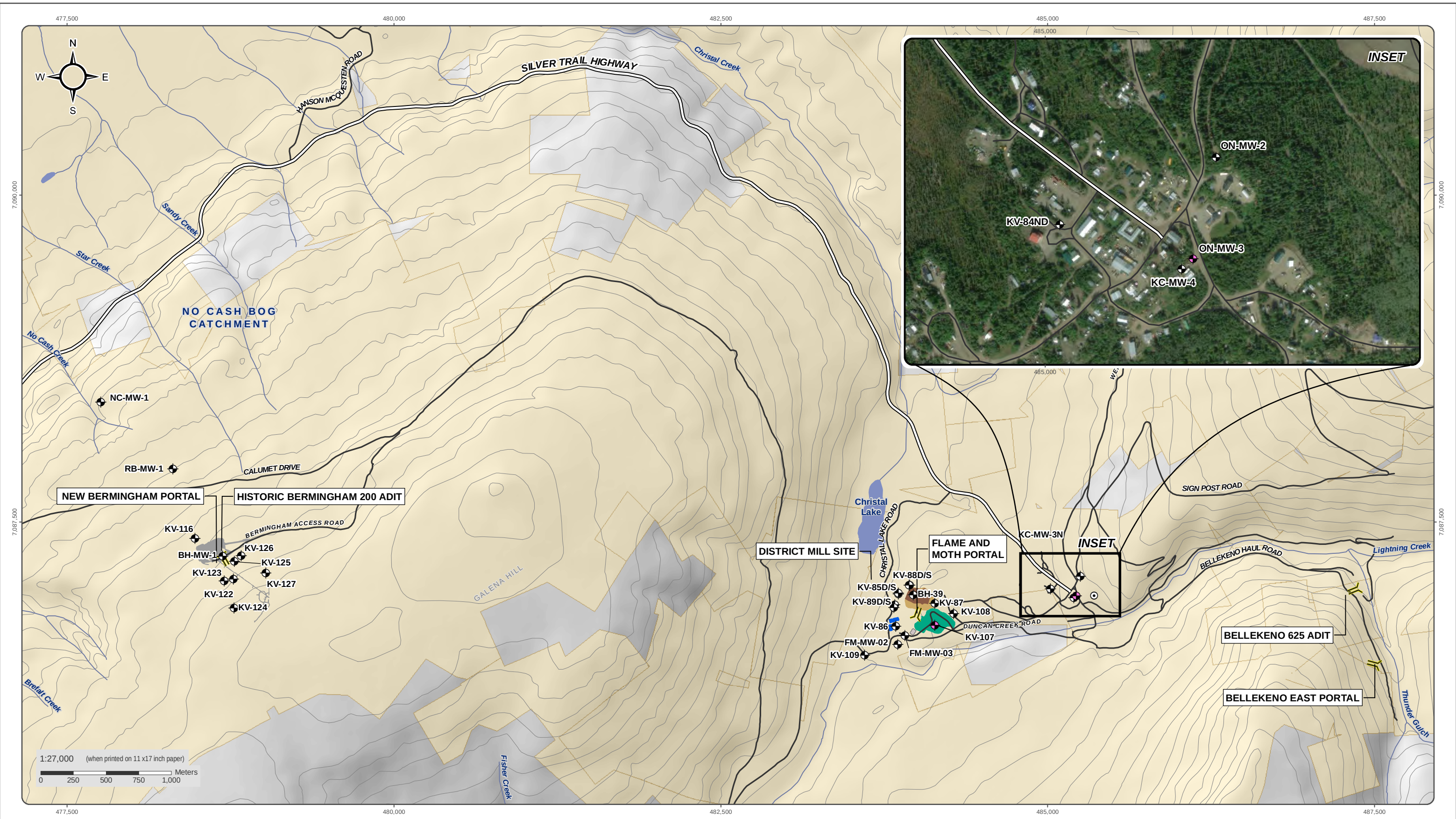


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**FIGURE 6-1
SURFACE WATER QUALITY STATION LOCATIONS**

MARCH 2022

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(Last edited by: amafastevska, 2021-02-25/11:25 AM)



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- Proposed Monitoring Well
- Monitoring Well
- Adit

- As-Built Mine Footprint
- Pond
- DSTF 322k Tonnes Design
- Current DSTF
- To Be Constructed Mine Features

- Alexco/ERDC Quartz Claims
- Silver Trail Highway
- Other Road



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FIGURE 6-2
KHSD GROUNDWATER
MONITORING LOCATIONS

MARCH 2022

D:\Project\AI\Projects\Keno_Area_Mines\ALL_SITES\02-Map\01_Overview\04-WQ\GW\District\GW_monitoring_locations_District_AMP_20220308.mxd
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6.1.2 Environmental Effects Monitoring

The Bellekeno Mine became subject to the MDMER September 7, 2010 when the treated effluent flow rate from Bellekeno 625 water treatment facility exceeded 50 m³ per day. Under the MDMER of the Fisheries Act, Environmental Effects Monitoring (EEM) must be conducted to determine whether mine effluent contributes to effects on benthic invertebrate communities, fish populations and/or fish tissues.

The Bellekeno Mine Cycle 1 EEM Study Design was developed in 2011 and implemented in 2012; a second cycle in 2015, and a third cycle in 2018. The Cycle 4 EEM Study Design was finalized in March 2021 and the Cycle 4 EEM study was initiated in August 2021 and completed in October 2021. The *Bellekeno Mine Environmental Effects Monitoring Cycle 4 Interpretive Report* (Ensero 2022) describes results and interpretations of the Cycle 4 EEM study and was submitted to Environment Canada and Climate Change in March 2022.

The Flame & Moth Mine triggered the MDMER November 30, 2020. In accordance with the MDMER, a Cycle 1 EEM Study Design was developed and will be implemented in 2022 and 2023 (benthic and fish study, respectively).

6.1.3 Permafrost Monitoring

Permafrost monitoring through geotechnical programs installed at the DSTF is monitored routinely by the engineers of record (Tetra Tech EBA Inc.) in accordance with the DSTF OMS Manual, which forms part of the *DSTF Construction and Operation Plan*. Ground temperature and permafrost monitoring is currently in place at these locations. Results of the 2021 permafrost monitoring can be seen in the Tetra Tech EBA Inc. monitoring report in Appendix A.

6.1.4 Physical Inspections

NELPCo was retained to complete the 2021 annual inspection of the surface engineered earth structures located throughout the Bellekeno Mine and District Mill site. Tetra Tech, NELPCo's exclusive engineering services provider conducted the inspection on August 26, 2021. A copy of the *2021 Annual Physical Inspection Report* which includes surface inspections is included as Appendix A.

The following maintenance actions were taken as a result of the engineers' recommendations:

- Erosion at Lightning Creek Bridge abutment on the Bellekeno Haul Road backfilled;
- Torn liner at Bellekeno 625 water treatment facility secondary pond outlet repaired;
- Sinkhole and blowout on DSTF repaired;
- DSTF runoff berm cleared of tailings and erosion gullies repaired;
- Erosion gullies and shallow tension cracks on the DSTF repaired; and
- Fresh tailings covered with overburden to reduce erosion.

Weekly physical inspections to ensure the structural integrity of mine components were completed in 2021. Seepage or changes to conditions were reported AKHM management and evaluated to determine if a change in performance or physical conditions has occurred. Remedial actions were taken as required.

Mining One PTY Ltd. conducted a review of ground control management in Q4 2021. The review found that the Ground Control Management Plan in general, complied with the minimum requirements defined by the mine regulations and industry-accepted best practice. Content changes were recommended.

6.1.5 Meteorological Monitoring

A meteorological station was established on Galena Hill in summer 2007 by Alexco. The station measures air temperature, relative humidity, barometric pressure, rainfall, wind speed and direction, solar radiation, and soil temperature. As a condition WL Z18-044, a second meteorological station and snow course was established at the District Mill site. The location of the mill site weather station is shown on Figure 6-4. A YG monitored snow course station also exists in the area. An analysis of the meteorological monitoring data results can be seen in the WL QZ18-044 2021 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

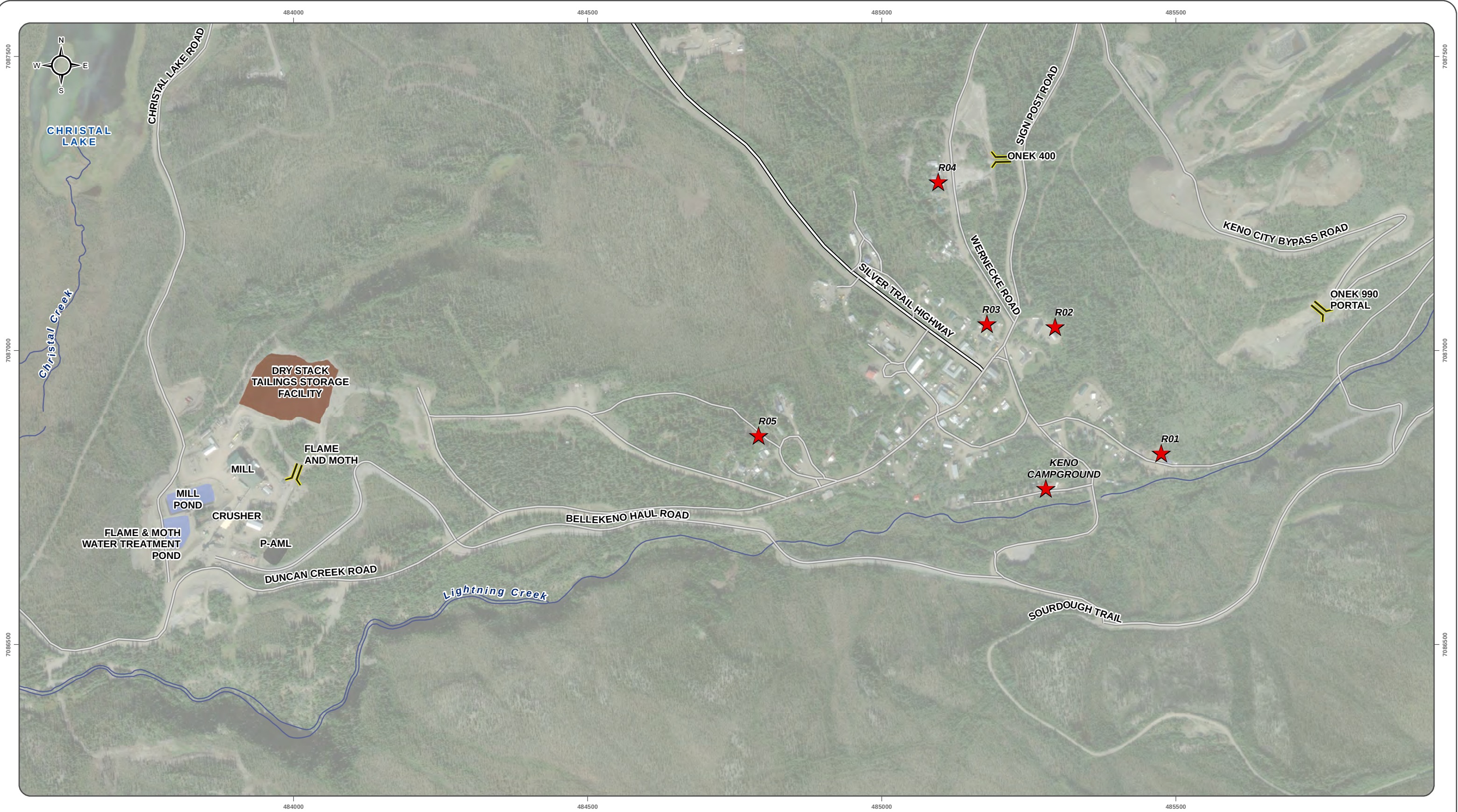
6.1.6 Noise Impacts and Sound Monitoring

The objective of noise impact monitoring is to reduce and mitigate impacts to local residents and the environment resulting from noise produced during the development and operations of the Bellekeno and Flame & Moth mines and District Mill. To achieve this goal, AKHM identified potential noise sources and receivers in the *Noise Monitoring and Management Plan*. Details are be found in the *Noise Monitoring and Management Plan* submitted under QML-0009. An update to this plan was approved on December 9, 2021.

During 2021 there were no noise complaints made to AKHM. All surface heavy duty surface equipment has been outfitted with low frequency back up alarms, crushing and ore haulage activities continue to be limited to dayshift only. The crusher building is now fully enclosed with in an insulated steel building. No significant noise impacts were recorded in Keno City as a result of operations in Q4 2021. The results for the noise monitoring program up to 2021 are presented in Appendix B and the locations at which recordings were made is shown in Figure 6-3.

6.1.7 Dust Abatement and Monitoring

The air quality monitoring program was established in 2009. In 2011 air quality was monitored using dustfall monitoring stations installed at four locations near the District Mill. The monitoring program was amended in 2012 to included the measurement of total particulates per volume of air for select size fractions (total suspended particulates [TSP]). Additional sampling for coarse (PM₁₀) and fine (PM_{2.5}) fractions of particulate matter began in August 2015. An updated *Dust Abatement and Monitoring Plan* was approved on December 9, 2021. The air quality sampling stations were used in 2021 are shown on Figure 6-4. Dust suppression measures were implemented as required along Christal Lake Road and when the Bellekeno Haul Road was in routine use. The TSP, PM₁₀ and PM_{2.5} monitoring, and total metals analysis of the TSP filters results are presented in Appendix C.



Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on January 2021

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 Noise Monitoring Station

 Adit

 Current DSTF

 Pond

 Mine Feature Footprint

 Watercourse

 Silver Trail Highway

 Secondary Road



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QML-0009

FIGURE 6-3
NOISE MONITORING STATIONS

MARCH 2022

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6.1.8 Waste Rock Monitoring

Representative samples were collected from development at Flame & Moth and New Bermingham mines and sent to an accredited laboratory for confirmatory testing as per the *Waste Rock Management Plan – Revision 6.5*. The results of the geochemical characterization of the 2021 development waste rock are summarized in Appendix E of the WL QZ18-044 2021 Annual Report, which is available on the Yukon Water Board’s online registry Waterline (www.yukonwaterboard.ca/waterline).

6.1.9 Tailings Monitoring

The results of the geochemical and physical tests on 2021 tailings samples are compiled in Appendix D of the WL QZ18-044 2021 Annual Report, which is available on the Yukon Water Board’s online registry Waterline (www.yukonwaterboard.ca/waterline).

6.1.10 Wildlife Monitoring

The Keno Hill Silver District, including Elsa, the Silver Trail Highway, District Mill, Bellekeno, Flame & Moth, and Bermingham mine sites, and all associated haul roads are frequented by natural wildlife in the area. This wildlife includes fox, bear, moose, wolverine, rabbit, lynx, and a number of other species of animal and birds. Wildlife encounters are recorded in a log located in the Mill Administration Office and the Flat Creek Camp kitchen. The most common sightings involved moose, porcupines, foxes, martens, and black bears in 2021. Other less common sightings involved grizzly bears, lynx, and wolves.

Any encounters between vehicles, employees and contractors and wildlife are reported to both the Safety and Environmental departments for documentation and if required, incident investigation. There have been no encounters between AKHM vehicles and wildlife from 2014 to date. Between May and July 2021 there were several sightings of black bears proximal to the Flat Creek Camp. No other significant wildlife encounters were reported in 2021.

6.1.11 Traffic Management

The procedures and protocols for site access, traffic routing management, and company policy with respect to vehicle and employee transportation during the KHSD Mining Operations are outlined in the October 2021 *Traffic Management Plan* (approved December 2021). There were no traffic disturbance claims made to AKHM in 2021.

In 2021, signage was installed at intersections where mine traffic intersected with public roadways as illustrated in Figure 6-5, Figure 6-6 and Figure 6-7. Mileage/direction markers were erected from the District Mill to the Bermingham Mine at 1 km intervals. All mine traffic is radio controlled along haulage and access roads. Employees, contractors and supply vehicles identify their location and travel direction to alert on coming mine traffic.

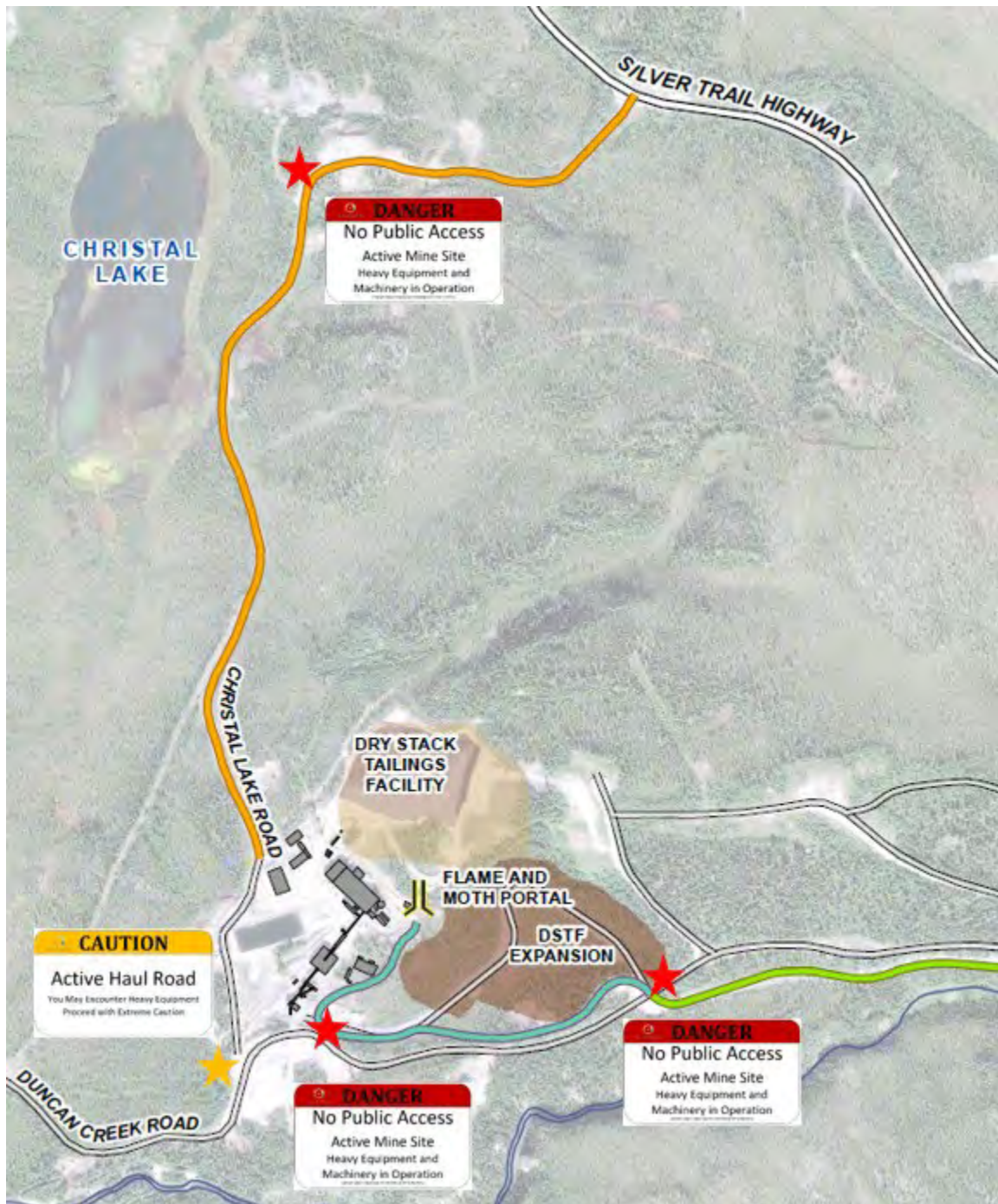


Figure 6-5: Christal Lake Road and District Mill Signage

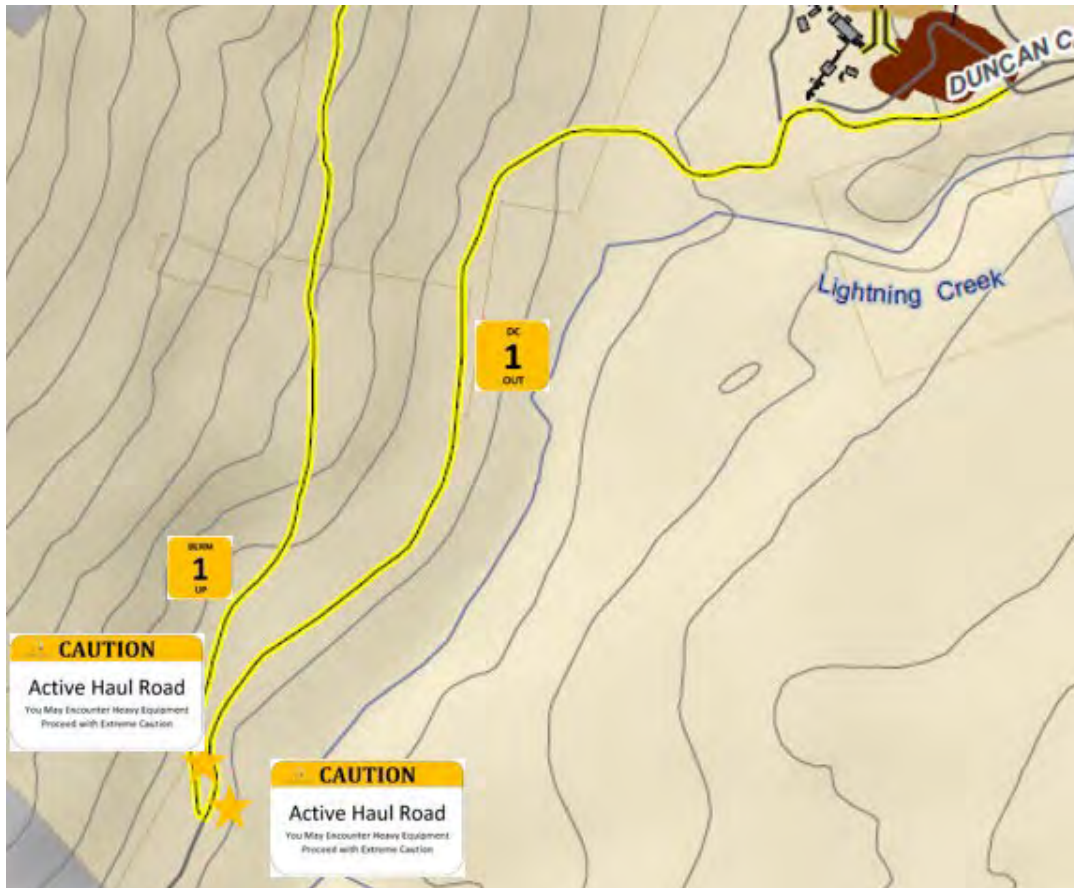


Figure 6-6: Duncan Creek Road Signage

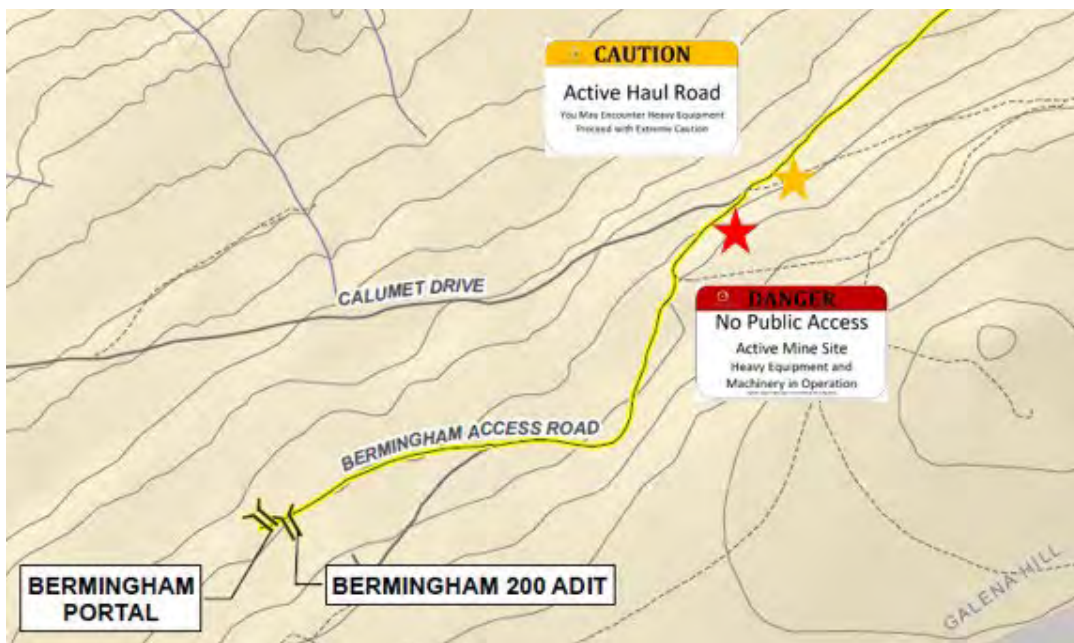


Figure 6-7: Calumet Drive Signage

6.2 ADAPTIVE MANAGEMENT PLAN

The *Adaptive Management Plan* (AMP) is designed to guide responses to unforeseen events respecting water quality and quantity and physical conditions of site workings and infrastructure. The adaptive management approach provides for assessment of mitigation measures and their effectiveness and guides the orderly implementation of responses. Since it is not possible to predict the specific environmental condition that may arise which requires a management response, the AMP does not provide specific detailed descriptions of responses to a situation. Moreover, by not providing specific responses, the plan is more flexible to allow innovative contingency measures to be implemented. The AMP provides a range of possible responses to use as a guide to respond to specific conditions that may be encountered.

During 2021, site inspections and routine adjustments to the treatment systems were conducted for maintenance purposes in accordance with the AMP and WL conditions. These records are maintained at the mine office, with copies held at the corporate office for review if necessary. No adaptive management activities were undertaken during 2021.

An updated *Adaptive Management Plan* (AMP) (dated October 2021) was submitted for review and approval pursuant to Section 6.0 and Schedule C Part 2 of QML-0009. In 2021, an independent contractor was retained to conduct an audit of the 2018 and 2020 AMPs in accordance with the requirements of QML-0009 Section 12.0. The audit identified opportunities for improvement and recommended modifications and updates to the 2020 AMP (Morrison, 2021). The October 2021 AMP was approved December 2021, subject to an update to address the recommendations of the audit and directions provided by the Director, Mineral Resources, Energy Mines and Resources. AKHM is preparing an update to the AMP to incorporate the findings of the audit.

6.3 REPORTABLE SPILLS

No reportable spill occurred in 2021. Minor spills that occurred in 2021 have been documented as part of the monthly reports submitted as part of WL QZ18-044.

6.4 PERMIT EXCEEDANCES

There were 32 exceedances of WL QZ18-044 during 2021 relating to Bellekeno Mine, Flame & Moth Mine and Bermingham Mine discharge effluent quality standards. The exceedances are discussed further in the WL QZ18-044 2021 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

7 CARE AND MAINTENANCE AND RECLAMATION

7.1 CARE AND MAINTENANCE ACTIVITIES

Care and Maintenance activities and performance monitoring (i.e. water quality monitoring) in the KHSD is undertaken by ERDC, using AKHM on-site laboratory facilities for daily and weekly water quality analysis. A detailed discussion of Care and Maintenance activities can be found in 2021 Annual Water Licence report submitted to the Yukon Water Board as per WL QZ17-0076, which is available on the Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

7.2 RECLAMATION ACTIVITIES

7.2.1 Temporary Closure Activities

In November 2021 the Bellekeno Mine entered the temporary closure. On-going routine monitoring and maintenance of the site infrastructure and facilities will continue until mining recommences or full closure is initiated.

In 2021, the miners' office buildings with septic storage, and miners' dry was removed, and the P-AML waste rock storage facility decommissioned. The maintenance shop was removed in 2020.

Reclamation measures completed at the Bellekeno Mine in 2021 included:

- Relocating remaining P-AML waste rock (600 tonnes) from surface to underground;
- Relocating 174 m³ of sludge from Bellekeno 625 water treatment facility settling pond to underground;
- Removing/salvaging underground assets and equipment;
- Removing/salvaging the miners' office buildings with washroom trailer, and miners' dry;
- Removing hazardous materials from the underground; and
- Shipping special waste off-site for disposal.

There was some equipment left underground that had either minimal salvage value or the cost to remove exceeds any salvage value. The following equipment left underground includes:

- Electrical cable;
- Electrical junction boxes;
- Steel piping;
- Hoses; and
- Vent tubing.

Upcoming temporary closure activities for the Bellekeno Mine include:

- Fencing of the Bellekeno East Portal entrance;
- Fencing of the Bellekeno 625 Adit entrance;
- Fencing of the 200 Level Vent Raise;
- Resloping the N-AML waste rock facility;
- Decommissioning the former fuel tank farm, and
- Ensuing adequate site run-off management.

Mine access will be restricted by fencing. The former Bellekeno fuel tank will be cleaned, decommissioned, and removed. The tank farm will be either recommissioned and permitted as a short-term land treatment facility for petroleum hydrocarbon contaminated soils or cleaned and removed and landfilled.

7.2.2 Progressive Reclamation Activities

During temporary closure the lined ponds at Bellekeno 625 will be converted into a bioreactor and serve as a contingency treatment system. The remaining sludge will need to be removed (vacuum truck) from the Bellekeno 625 water treatment system in 2022.

Progressive reclamation of the DSTF is implemented on an ongoing basis to maintain site stability and control dust by reclaiming areas as soon as operationally possible. Progressive reclamation occurs through recontouring the side slopes to the final design slope angle (3:1) and placing granular/organic material as a cover.

7.2.3 Reclamation Planning

Revision 6 of the *Reclamation and Closure Plan* (RCP) was submitted to the Yukon Water Board on November 29, 2021. The RCP provides details about progressive reclamation activities and reclamation research.

The following reclamation research programs and field validation programs are in progress and the results will be utilized for reclamation and closure planning by AKHM:

- Observation of the physical conditions of the cover system and vegetation field trials completed in 2019 on the DSTF;
- Natural attenuation studies; and
- In situ mine water treatment demonstration at the historic Silver King Mine.

A detailed discussion of reclamation research can be found in the 2021 Annual Water Licence report submitted to the Yukon Water Board as per WL QZ18-044, which is available on the Board's online registry Waterline (www.yukonwaterboard.ca/waterline). Further discussion on the long-term water management at Bellekeno can also be found in that report.

8 SOCIO-ECONOMIC MEASURES

Alexco leadership met with the residents of Keno City twice in 2021. Several community concerns were heard, and two prominent issues were identified for which AKHM could provide relief as described below. In addition, AKHM management has made itself available for regular email correspondence and personal tours for residents.

8.1 CLOSURE OF THE KENO CITY TRANSFER STATION

AKHM met with the office of the YG Director of Operations and Programs, Department of Community Services to determine how the company might help mitigate the impact of the transfer station closure scheduled in 2022. The discussion ultimately led to a conceptual plan allowing AKHM to provide a household refuse haulage service to the Village of Mayo for Keno City residents pending a negotiated agreement between the YG and the Village of Mayo.

8.2 LOSS OF KENO CITY VOLUNTEER FIRE TRUCK

AKHM met with the Fire Marshal and Director of Fire and Life Safety, Department of Community Services to discuss how AKHM might mitigate the loss of emergency services in Keno City. Several action items were discussed and implemented:

- AKHM will be added to the government emergency notification system. When 911 calls for Keno City are initiated, AKHM will be notified to respond. AKHM does not have fire fighting capabilities but will provide emergency medical support, heavy equipment and water tenders and other support. AKHM efforts will be coordinated with the Village of Mayo fire department.
- AKHM has created a 24-hour emergency call out number for the citizens of Keno until the 911 notification system has been enabled for AKHM. The 24 Hour AKHM emergency call out system has been implemented and tested with Keno City residents.
- AKHM has procured and supplied the residents of Keno City an automated external defibrillator (AED) to replace the unit which had previously been damaged.
- AKHM has procured and supplied the residents of Keno City two wheeled fire extinguishers to attempt to offset the loss of a community fire truck.
- AKHM has scheduled two standard first aid classes open to participation for the residents of Keno City for Q2 2022.

9 REFERENCES

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- SRK Consulting, *Technical Report on the Onek Deposit, Onek Property, Keno Hill District, Yukon. SRK Project 2CA017.001*. Prepared for Alexco Resource Corporation, September 8, 2011b.
- SRK Consulting, *Technical Report on the Bermingham Deposit, Bermingham Property, Keno Hill District, Yukon*, 2012.

APPENDIX A

2021 ANNUAL PHYSICAL INSPECTION



November 30, 2021

Alexco Keno Hill Mining Corp.
Suite 1225 – 555 Burrard St.
Vancouver, BC
V7X 1M9

ISSUED FOR USE
FILE: 704-ENG.WARC04064-01
Via Email: stolgyesi@alexcoresource.com

Attention: Sebastien Tolgyesi, P.Eng., P.Geo.
Operations Manager

Subject: 2021 Annual Geotechnical Inspection – Mining Related Structures
Bellekeno Mine – Keno City, YT

1.0 INTRODUCTION

NND EBA Land Protection Corp. operating as NELPCo Limited Partnership (NELPCo) was retained Alexco Keno Hill Mining Corp (Alexco) to complete the 2021 geotechnical inspection of the structures related to development of the Bellekeno Mine near Keno City, Yukon.

NELPCo is a limited partnership corporation owned by the NND Development Corporation (NNDDC) and Tetra Tech Canada Inc. (Tetra Tech). The inspection was conducted by Tetra Tech, NELPCo's exclusive engineering services provider.

Authorization to complete this work was received by way of an Alexco Purchase order (PO #00753) dated July 9, 2021. Please see the enclosed report provided by Tetra Tech which summarizes the finding from the annual inspection, and corresponding recommendations.

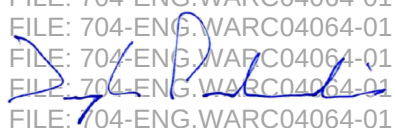
2.0 LIMITATIONS OF REPORT

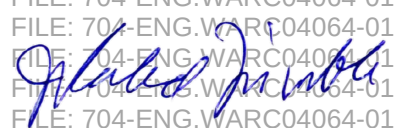
This report and its contents are intended for the sole use of Elsa Reclamation and Development Co. Ltd. and their agents. NELPCo Limited Partnership (NELPCo) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Elsa Reclamation and Development Co. Ltd, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

3.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
NELPCo Limited Partnership

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APPENDIX A

LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of NELPCO Limited Partnership's (NELPCo) Client (the "Client") as specifically identified in the NELPCO Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). NELPCO does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by NELPCO.

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Both electronic file and/or hard copy versions of NELPCO's Instruments of Professional Service shall not, under any circumstances, be altered by any party except NELPCO. NELPCO's Instruments of Professional Service will be used only and exactly as submitted by NELPCO.

Electronic files submitted by NELPCO have been prepared and submitted using specific software and hardware systems. NELPCO makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by NELPCO for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of NELPCO.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with NELPCO with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for NELPCO to properly provide the services contracted for in the Contract, NELPCO has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO NELPCO BY OTHERS

During the performance of the work and the preparation of this Professional Document, NELPCO may have relied on information provided by third parties other than the Client.

While NELPCO endeavours to verify the accuracy of such information, NELPCO accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to NELPCO at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

NELPCO is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, NELPCO has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. NELPCO does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. NELPCO does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

NELPCO will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. NELPCO cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

November 30, 2021

Alexco Keno Hill Mining Corp.
Suite 1225 – 555 Burrard St.
Vancouver, BC
V7X 1M9

ISSUED FOR USE
FILE: 704-ENG.WARC04064-01
Via Email: stolgyesi@alexcoresource.com

Attention: Sebastien Tolgyesi, P.Eng., P.Geo.
Operations Manager

Subject: 2021 Annual Geotechnical Inspection – Mining Related Structures
Bellekeno Mine – Keno City, YT

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech), NELPCo's exclusive engineering service provider, was retained by Alexco Keno Hill Mining Corp (Alexco) to complete the 2021 annual geotechnical inspection of structures related to development of the Bellekeno Mine near Keno City, Yukon. Authorization to complete this work was received by way of an Alexco purchase order (PO# 00753) dated July 09, 2021.

2.0 SCOPE OF SERVICES

The following is Tetra Tech's scope of services for the 2021 annual inspection as was presented in the email submitted to Alexco on June 16, 2021:

- Complete a visual inspection of the earth structures identified by Alexco, which include:
 - Bellekeno Mine
 - Potentially acid generating (PAG) waste storage facility;
 - Bellekeno Road waste rock pile;
 - Bellekeno 625 water treatment ponds and discharge line;
 - Lightning Creek bridge abutments (Onek and Bellekeno);
 - Mill water storage ponds; and
 - Dry stacked tailings facility, including readings of the slope indicators and thermistor cables that are still operational within and around the dry stacked tailings facility.

The location of these structures is shown on Figure 1.

While on site, a sludge containment storage area located at Alexco's Bermingham property was also inspected.

Finally, an inspection report will be prepared that documents the results of the inspection, including a summary of the stability, integrity, and status of all the inspected structures, and any recommendations for remedial actions.

3.0 INSPECTION SUMMARY AND RECOMMENDATIONS

The 2021 annual inspection was completed by Tetra Tech representatives Mr. Richard Trimble, P.Eng., and Mr. Taylor Pasloski, P.Eng. on August 26, 2021 along with Alexco representatives Mr. Sebastien Tolgyesi, P.Eng., P.Geo. and Mr. Neil Chambers, P.Eng. The following sections summarize observations for each structure and describe remedial actions required to improve stability, if necessary. The recommended remedial actions have been separated into geotechnical stability concerns and ongoing facility maintenance to assist in the prioritization of remedial efforts. Selected photographs taken during the inspection are included where appropriate.

3.1 Bellekeno Mine

3.1.1 PAG Waste Facility

The PAG waste storage facility is located south of the Bellekeno portal, as shown on Figure 1. The facility has not been used since mining operations were suspended in 2013, but currently contains some volume of waste rock. At the time of the inspection, the perimeter berms appeared intact with no visible sign of instability. Some water was accumulated in the base of the storage facility and the entrance was in rough shape. If the PAG is extended beyond the access berm, the berm, liner, and underlay should be replaced and repaired. It is understood that this PAG material will eventually be moved back underground.



Photo 1: Bellekeno PAG Storage Facility (August 26/21)

3.1.2 Bellekeno Road Waste Rock Pile

The Bellekeno waste rock pile forms a portion of the Bellekeno Haul Road and is located north of the Bellekeno portal, as shown on Figure 1. At the time of the inspection the side slopes of the waste rock pile appeared to be intact and stable. No remedial action is required.



Photo 2: Bellekeno Road Waste Rock Pile/Haul Road (August 26/21)

3.1.3 Bellekeno 625 Water Treatment Ponds

The Bellekeno 625 water treatment ponds are located north of the Bellekeno 625 portal, as shown on Figure 1. The facility consists of two water treatment ponds that were both operating at the time of inspection. The primary treatment pond was operating at the discharge invert elevation with a freeboard of 0.5 m below the perimeter berm crest at the time of the inspection. The secondary pond was also operating at the discharge elevation, with a freeboard of 0.5 m in the south end. Treated water discharges through an HDPE pipe onto the hillside above Lightning Creek.

A small rip in the liner was identified at the end of the secondary pond, above the water and near pond outlet. The rip should be repaired.



Photo 3: Small Rip in Liner at Bellekeno 625 Water Treatment Ponds (August 26/21)

The pipe from the treated water pond discharges directly onto the natural soils above Lightning Creek without any protection from erosion. The discharge pipe was still unhooked at a coupler upstream from the original discharge location. The outlet of the pipe has subsided into the ground and only the top half of the pipe was exposed, and the ground was starting to erode. The pipe should be elevated or moved so that the outlet is unobstructed. If further erosion takes place, riprap armouring must be installed.



Photo 4: Bellekeno 625 Water Treatment Ponds, Discharge Location (August 26/21)

3.1.4 Lightning Creek Bridge Abutments (Bellekeno Haul Road)

The Lightning Creek Bridge on the Bellekeno Haul Road is located southwest of Keno City, as shown on Figure 1. The bridge is a single span steel structure with a wooden deck founded on earthfilled timber cribbed abutments. The abutments were stable at the time of the inspection and are sufficiently protected by riprap armouring from erosion of Lightning Creek.

Minor erosion was identified near the bridge abutment as shown in Photo 5. This erosion should be backfilled with coarse rock and the berms built up to maintain stability. The abutments should be monitored for future erosion.



Photo 5: Bellekeno Haul Road, Approach Erosion (August 26/21)

3.1.5 Lightning Creek Bridge Abutments (Onek Road)

The Lightning Creek Bridge on the Onek Road is located east of Keno City, as shown on Figure 1. The bridge is a single span steel structure founded on earth filled timber cribbing abutments. The abutments were stable at the time of the inspection and are sufficiently protected from erosion by riprap. No remedial action is required for the Lightning Creek Bridge on the Onek Road at this time.



Photo 6: Lightning Creek Bridge Abutments, Onek Road (August 26/21)

3.1.6 Mill Water Storage Ponds

The two mill water storage ponds are located at the Keno Hill District Mill Site, west of Keno City, as shown on Figure 1. At the time of the inspection the mill was operating, and both ponds contained some water with a freeboard of about 1.2 m below the perimeter berms in the older pond, and an estimated 2.4 m of freeboard in the newer pond. No remedial action is required for these ponds.



Photo 7: Mill Water Storage Pond (August 26/21)



Photo 8: Mill Water Storage Pond (August 26/21)

3.1.7 Dry Stacked Tailings Facility

The dry stacked tailings facility (DSTF) is located at the Keno Hill District Mill Site west of Keno City, as shown on Figure 1. Mining production has resumed since the previous inspection and tailings have been placed for the first time since 2013. All the tailings previously placed have been regraded, covered with organic materials and glacial till, then seeded as part of the progressive reclamation activities.

The condition of the DSTF requires immediate attention:

- A “sinkhole” and blow out (Photo 9 and Photo 10) were identified on the north end of the DSTF;
- Where the new tailings were placed, precipitation caused some tailings to erode (Photo 11) and accumulate in the runoff collection ditch;
- A shallow rotational failure (Photo 12) was identified on the north end of the DSTF, which has filled the runoff collection ditch; and
- A tension crack on the surface of the DSTF was observed near the approximate location of a tension crack identified in previous inspections.

The approximate location of all instabilities identified during the inspection are shown on Figure 2. The runoff berm should be cleaned out of tailings and other material from the shallow failure. The erosion gullies should be repaired, and the tailings should either be reclaimed or temporarily covered to reduce future erosion. The sinkhole, blow out, shallow failure, and tension cracks should be excavated to competent ground (no deeper than 2.5 m or to the liner), backfilled with excavated soil, and compacted with a backhoe bucket. The replaced material should be sloped no steeper than 3H:1V.

In addition to covering the tailings to prevent erosion, Alexco requested the use of velocity dissipation structures within the runoff berm of the DSTF to contain any eroded tailings and to help reduce operational maintenance. Tetra Tech has no reservations with this proposal. The dissipation structures should be constructed of granular soils free of fines and inspected and maintained frequently to ensure accumulated tailings do not exceed the runoff berm.

All of these locations should continue to be monitored and repaired as necessary over the year so that the potential for water ingress into the DSTF is reduced. Ideally, the repairs should be capped higher than the surrounding terrain to keep surface runoff water away.

It is recommended that the locations of all these instabilities be mapped, and new locations (if any), along with associated photographs, be added to an annual survey and submitted to the geotechnical engineer. The annual survey should be done in the spring, prior to any repairs.



Photo 9: DSTF Sinkhole (August 26/21)



Photo 10: DSTF Blow-Out (August 26/21)



Photo 11: DSTF Tailings Erosion (August 26/21)



Photo 12: DSTF Shallow Failure into Runoff Collection Ditch (August 26/21)

3.1.8 Instrumentation

Performance of the DSTF is monitored by taking regular readings on the instrumentation installed during and after construction. DSTF instrumentation consists of seven ground temperature cables installed to monitor permafrost (six in natural soils adjacent to the DSTF and one through tailings placed within the DSTF footprint), and three slope indicators installed to monitor lateral movement of the foundation soils. The locations of installed DSTF instrumentation are shown on Figure 2.

It should be noted that some critical instrumentation located within and adjacent to the DSTF is in need of repair and/or replacement. As further described below, the ground temperature cable in the centre of the DSTF (BH40) is the most critical of these installations and must be replaced as soon as possible.

3.1.8.1 Background Ground Temperature Readings

Updated ground temperature readings were collected from five of the six ground temperature cables installed in natural soils adjacent to the DSTF during the inspection. Readings were not collected from BH17 as the protective steel casing has been damaged, making the ground temperature cable inaccessible. The protective casing should be repaired or removed to allow for instrumentation readings.

As indicated on the updated ground temperature profiles included in Appendix B, the ground temperatures near surface have stabilized. Ground temperature at depth have indicated that ground temperature has decreased over the last few years. Some of the beads on ground temperature cables indicating temperatures less than -3°C may have been compromised and continued annual instrumentation readings are recommended to monitor ground temperature conditions.

The ground temperature cable installed in BH40, which extends through the tailings and into the foundation soils below to DSTF has been damaged and requires replacement. This is a critical installation needed to confirm design assumptions and provide ongoing temperature monitoring.

Access to BH15, BH18, and BH32 has overgrown with vegetation over the years and should be cleared to allow access for future monitoring.

3.1.8.2 Slope Indicator Readings

An updated lateral movement profile developed from readings collected from the slope indicator installed in BH36 is included in Appendix C. 50 mm of lateral movement was identified in BH36 since the last measurement. Tetra Tech does not consider this movement to be of concern at this time, but annual monitoring should continue. Alexco has excavated an area to the north west of the slope indicator to use as a laydown area. The movement identified in BH36 is in the direction of the laydown, and the displacement is considered as “creep” (or relaxing) of the soil towards the excavation.

BH38 was blocked off with what is assumed ice at approximately 5 m. The slope indicator should be cleaned out and preserved using liquid suitable for use in permafrost conditions. The slope indicator located at BH28 is blocked and was not recorded. This instrument has been non-operational for several years and should be replaced.

3.2 Bermingham Mine

3.2.1 Sludge Containment Facility

A lined pad was constructed below the water treatment plant at Alexco's Bermingham property to support a sludge containment bag. The water treatment plant was currently in operation at the time of the inspection, and no instabilities were noted. No remedial action is required for the facility.



Photo 13: Bermingham Mine (August 26/21)

4.0 CONCLUSION AND RECOMMENDATIONS

The structures inspected pose no significant risk to the environment or human health and safety in their current condition. The remedial actions recommended in the previous sections of this report are summarized in Table 4.1.

Table 4.1: Summary of Remedial Recommendations

Structure	Stability Recommendations	Maintenance Recommendations
BELLEKENO		
PAG Waste Storage Facility	None	- Repair access; - Repair and replace berm, liner, and underlay if extending the PAG beyond the access berm.
Bellekeno Road Waste Rock Pile	None	None
Bellekeno 625 Water Treatment Ponds	None	- Repair rip near secondary pond outlet; - Discharge line unhooked at coupler. Lift or move discharge hose to clear outlet. Monitor erosion and place riprap if required.
Lightning Creek Bridge Abutments (Bellekeno Haul Road)	None	- Backfill erosion at bridge abutment with granular soil; - Monitor for further erosion.
Lightning Creek Bridge Abutments (Onek Road)	None	None
Mill Water Storage Ponds	None	None
Dry Stacked Tailings Facility	- Repair or remove casing at BH17 to allow for ground temperature monitoring; - Install a new ground temperature cable to replace damaged cable at BH40; - Purge and clean BH38 and preserve using liquid suitable for use in permafrost conditions (silicone oil); and - Replace the slope indicator located at BH28.	- Repair sink hole and blow out; - Clean out runoff berm of tailings and repair erosion gullies; - Repair shallow failure; - Repair tension crack; - Reclaim or cover fresh tailings to reduce erosion; - Annual spring survey and photographs of instabilities, prior to repairs; - Continue annual instrumentation readings to monitor DSTF foundation conditions; and - Trim vegetation for future access to BH15, BH18, and BH32.
BIRMINGHAM		
Sludge Containment Facility	None	None

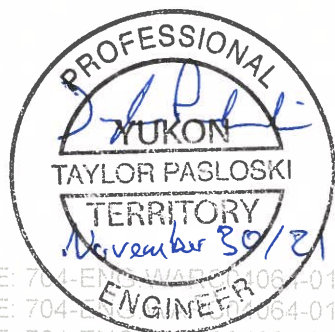
5.0 LIMITATIONS OF REPORT

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6.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.



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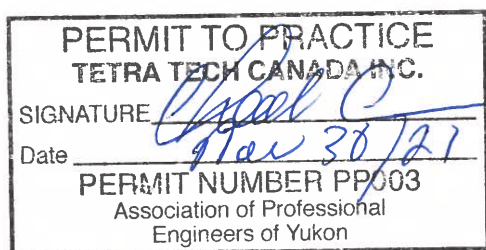
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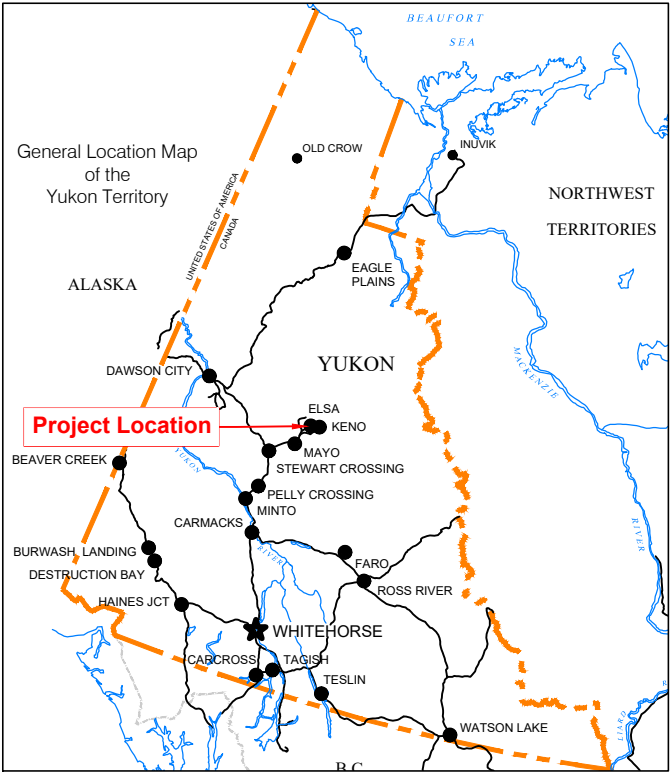
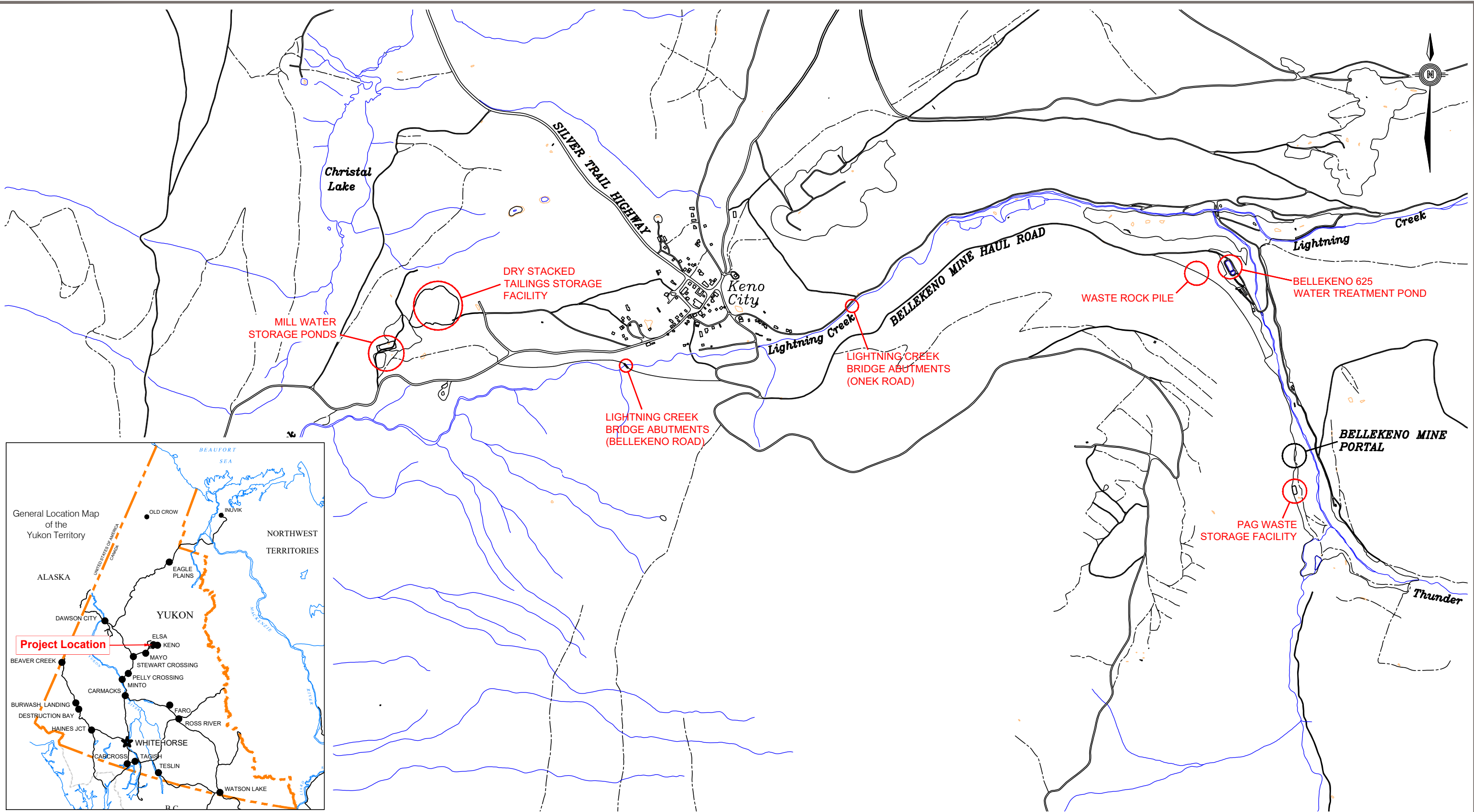
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FIGURES

- Figure 1 Site Plan Showing Structure Locations
Figure 2 Site Plan Showing Borehole and Instrument Locations

Q:\WhitehorseData\0201 Drawings\Keno\ENG\WARC04064-01 - 2021 AKHM Annual Inspection\ENG\WARC04064-01 Fig.1 RD.dwg [FIGURE 1] September 29, 2021 - 3:18:38 pm (BY: PASLOSKI, TAYLOR)



0 500m
Scale: 1:15,000 @ 11"x17"

NOTES
CONTOUR INFORMATION IS BASED ON DRAWING
PROVIDED BY ALEXCO RESOURCE INC.

CLIENT

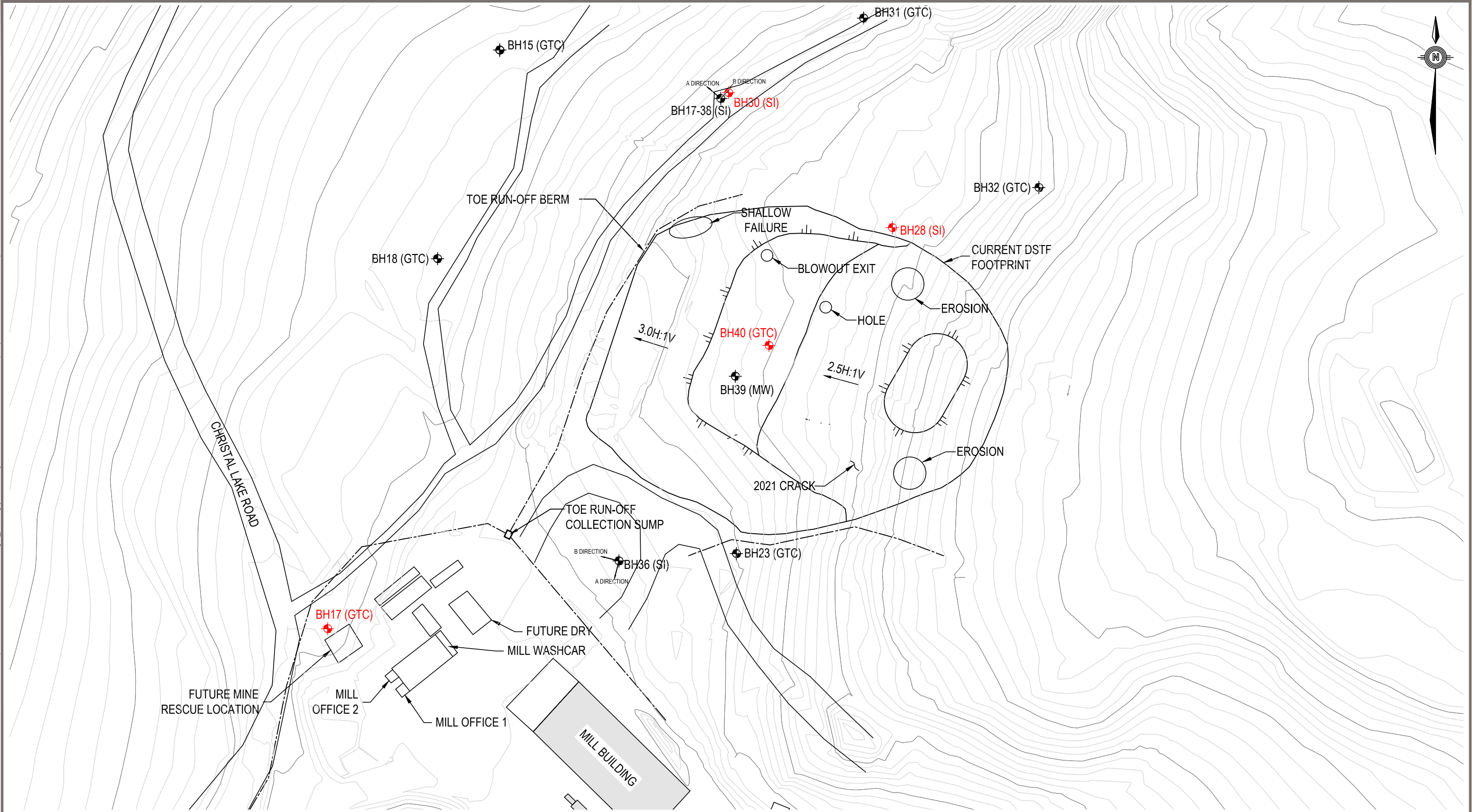


2021 AKHM ANNUAL INSPECTION
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING
STRUCTURE LOCATIONS

PROJECT NO. ENG.WARC04064-01	DWN TP	CKD JRT	REV 0	Figure 1
OFFICE EBA-WHSE	DATE September 29, 2021			

Q:\WhitehorseData\0201 drawings\Keno\ENG.WARC04064-01 - 2021 AKHM Annual Inspection\ENG.WARC04064-01 Fig.2_R0.dwg [FIGURE 2] November 03, 2021 - 12:51:07 pm (BY: PASLOSKI, TAYLOR)



LEGEND

- GTC - GROUND TEMPERATURE CABLE
SI - SLOPE INDICATOR
MW - MONITORING WELL

NOTE

INSTRUMENTATION SHOWN IN RED HAS BEEN DAMAGED OR DESTROYED AND IS NOT READABLE. SOME OF THESE NEED TO BE REPAIRED AND/OR REPLACED. SEE ACCOMPANYING REPORT TEXT.

CLIENT

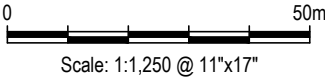


2021 AKHM ANNUAL INSPECTION
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING
BOREHOLE AND INSTRUMENTATION LOCATIONS

PROJECT NO. ENG.WARC04064-01	DWN TP	CKD JRT	REV 0
OFFICE EBA-WHSE	DATE September 29, 2021		

Figure 2



APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

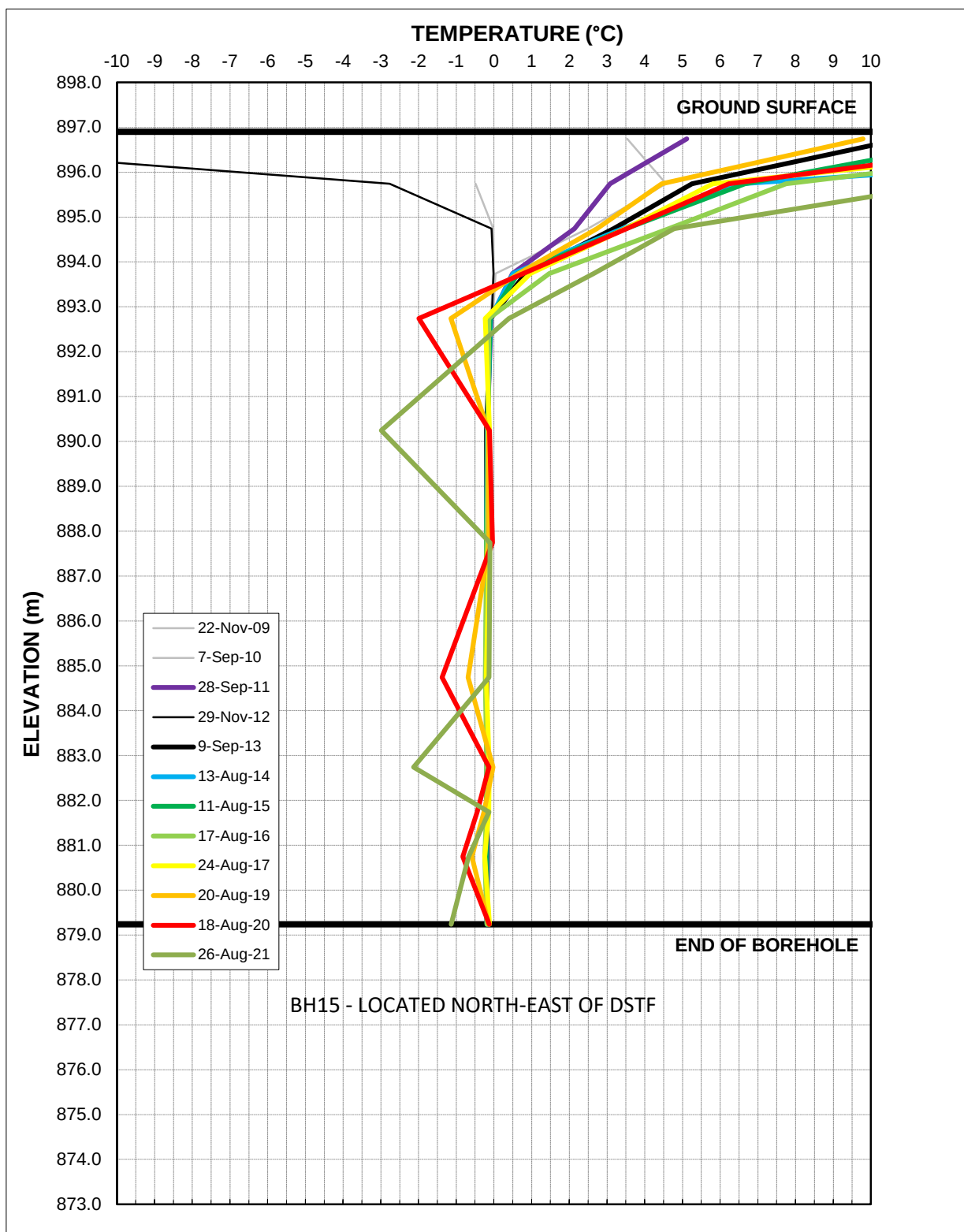
TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

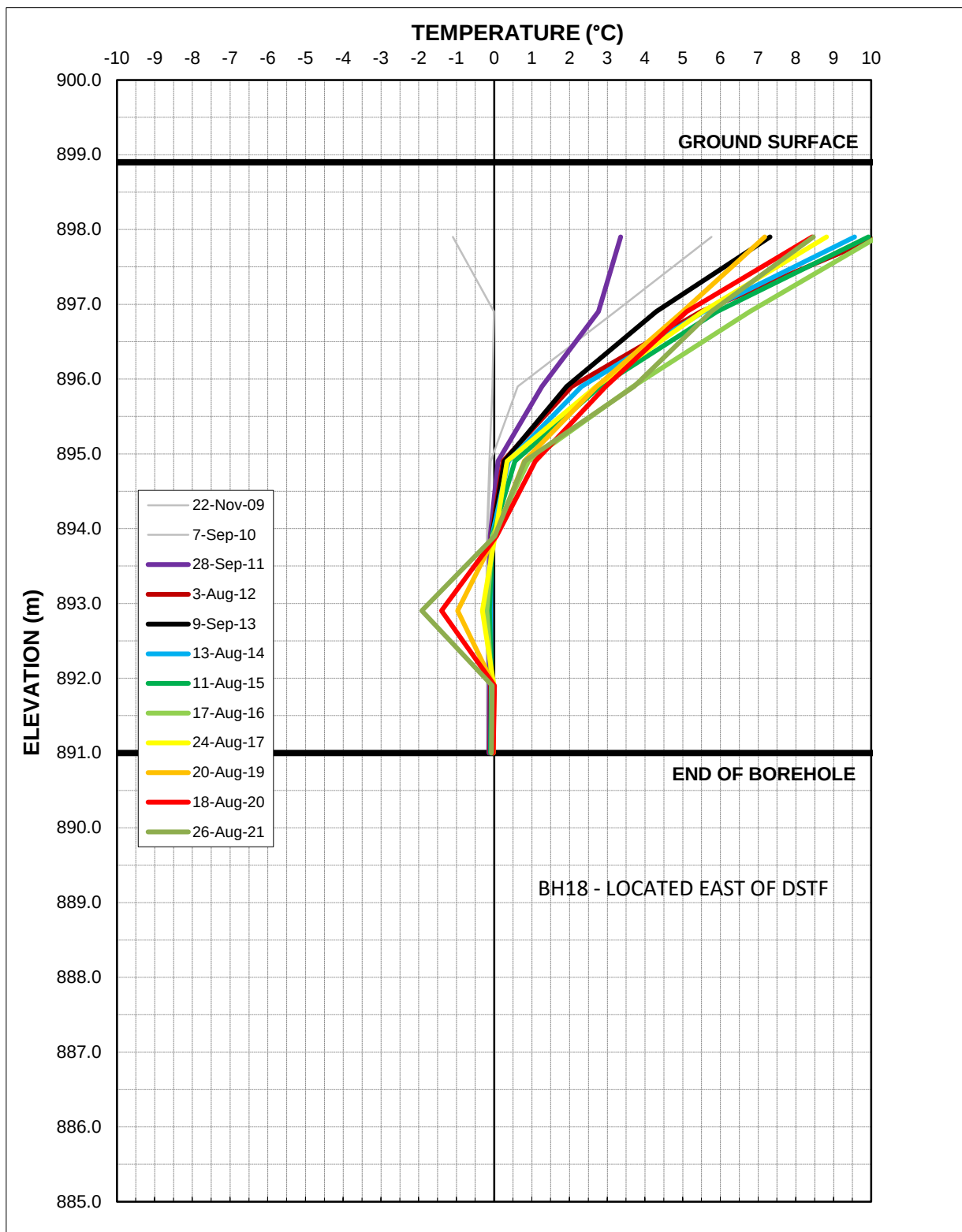
APPENDIX B

GROUND TEMPERATURE PROFILES



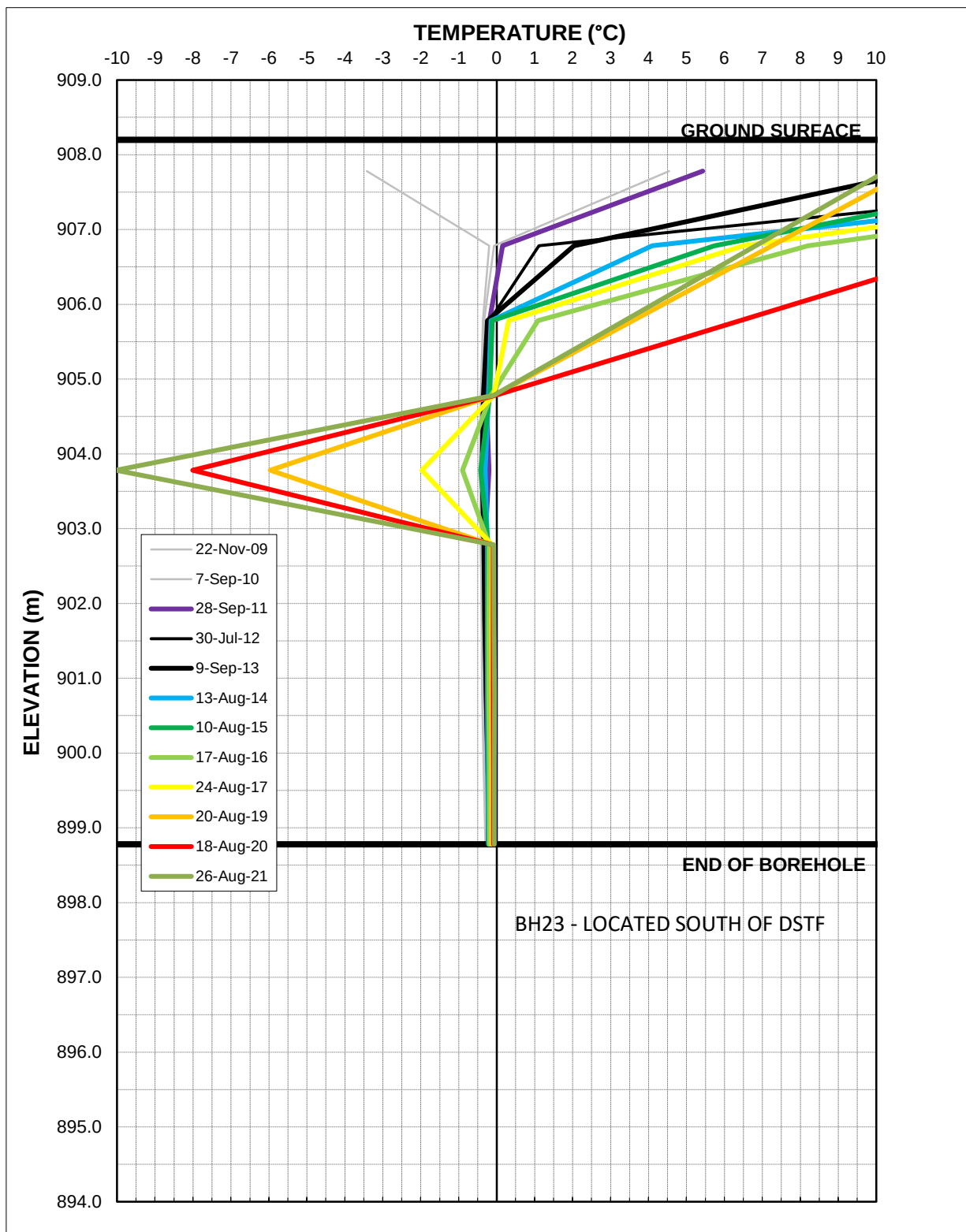
Install Date August 30, 2009
 Last Updated August 26, 2021
 Cable No: 2207

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1



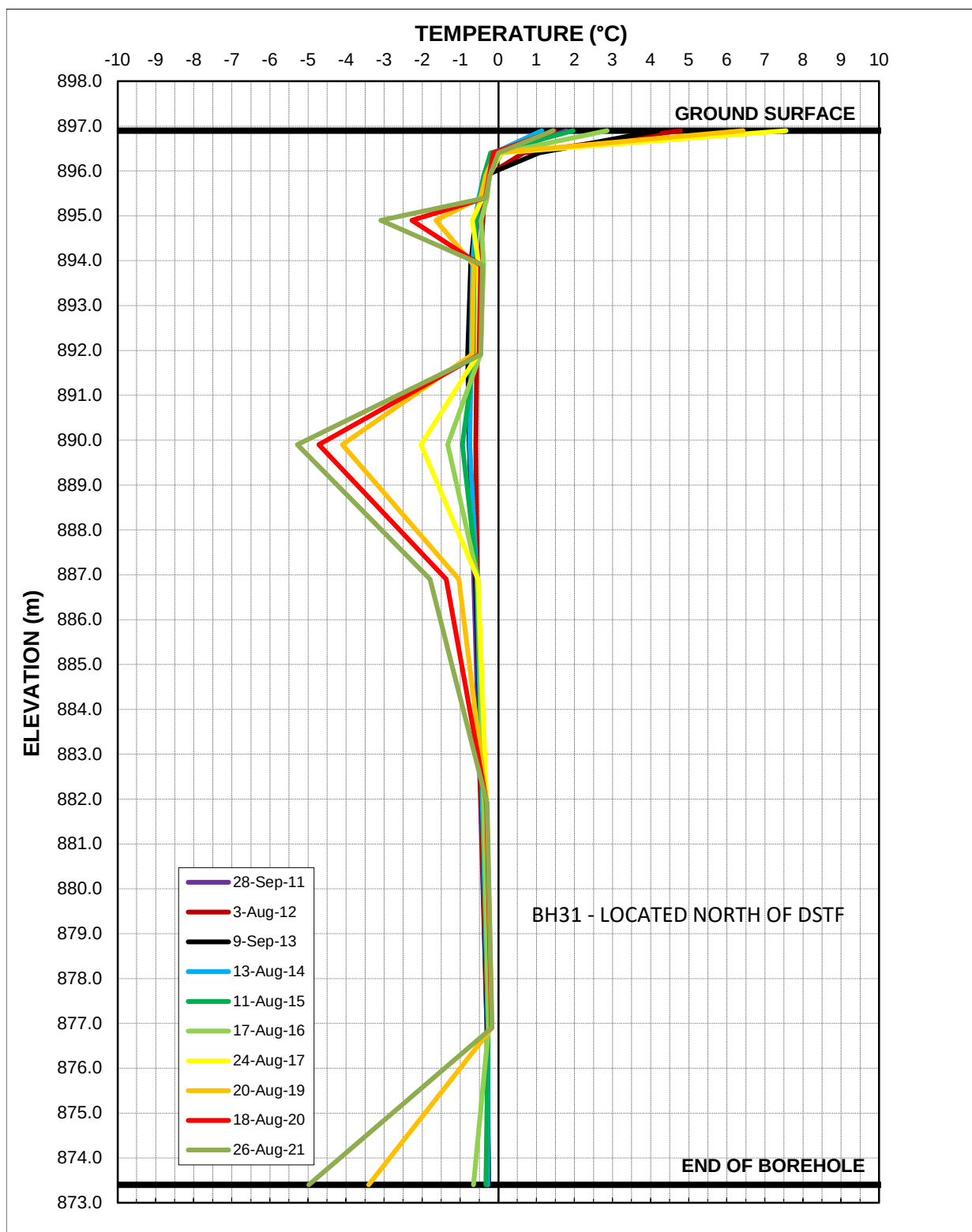
Install Date September 2, 2009
 Last Updated August 26, 2021
 Cable No: 2209

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH18
Figure T3



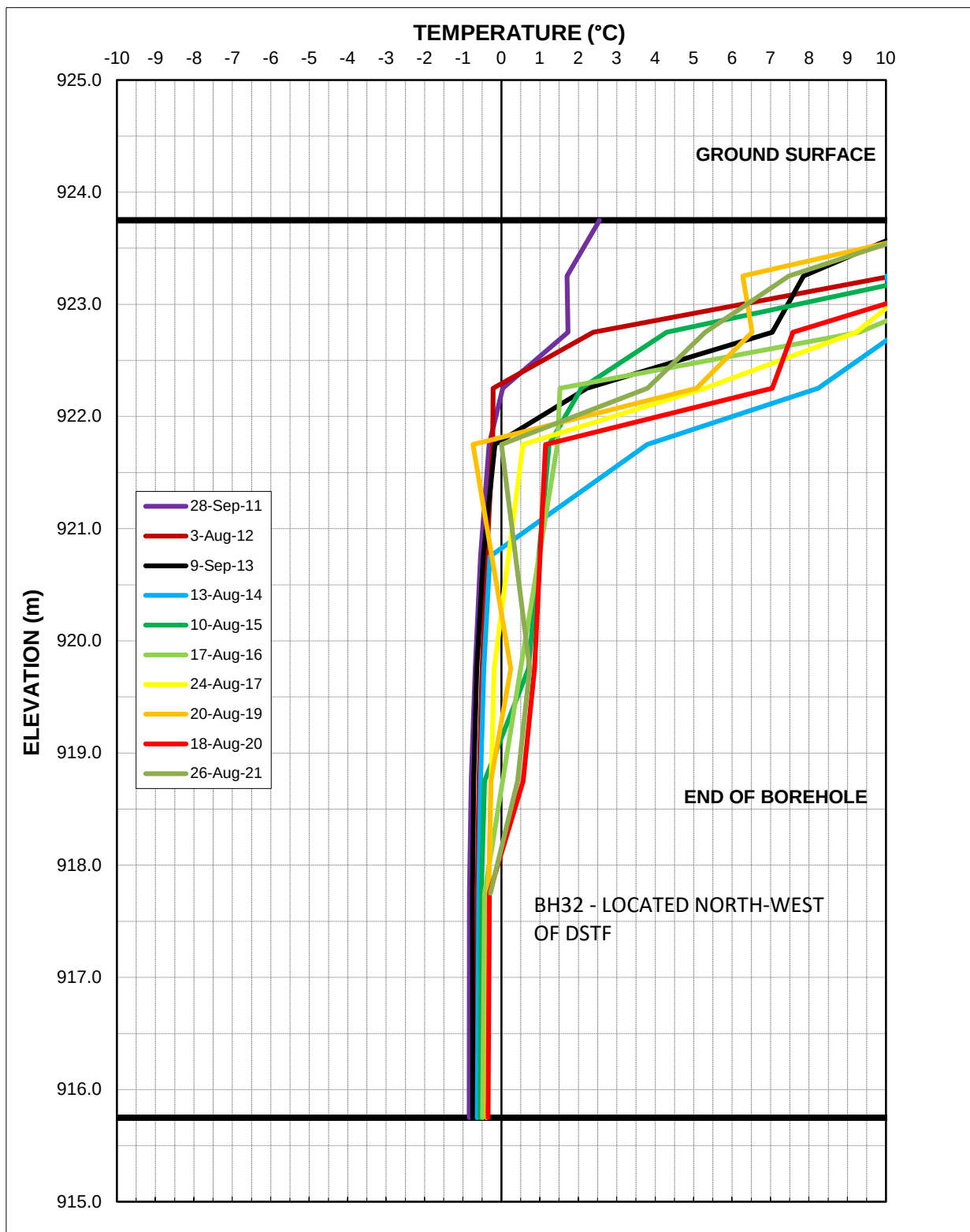
Install Date September 29, 2009
 Last Updated August 26, 2021
 Cable No: 2210

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH23
Figure T4



Install Date February 22, 2011
 Last Updated August 26, 2021
 Cable No: 2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5



Install Date February 22, 2011
 Last Updated August 26, 2021
 Cable No: 2264

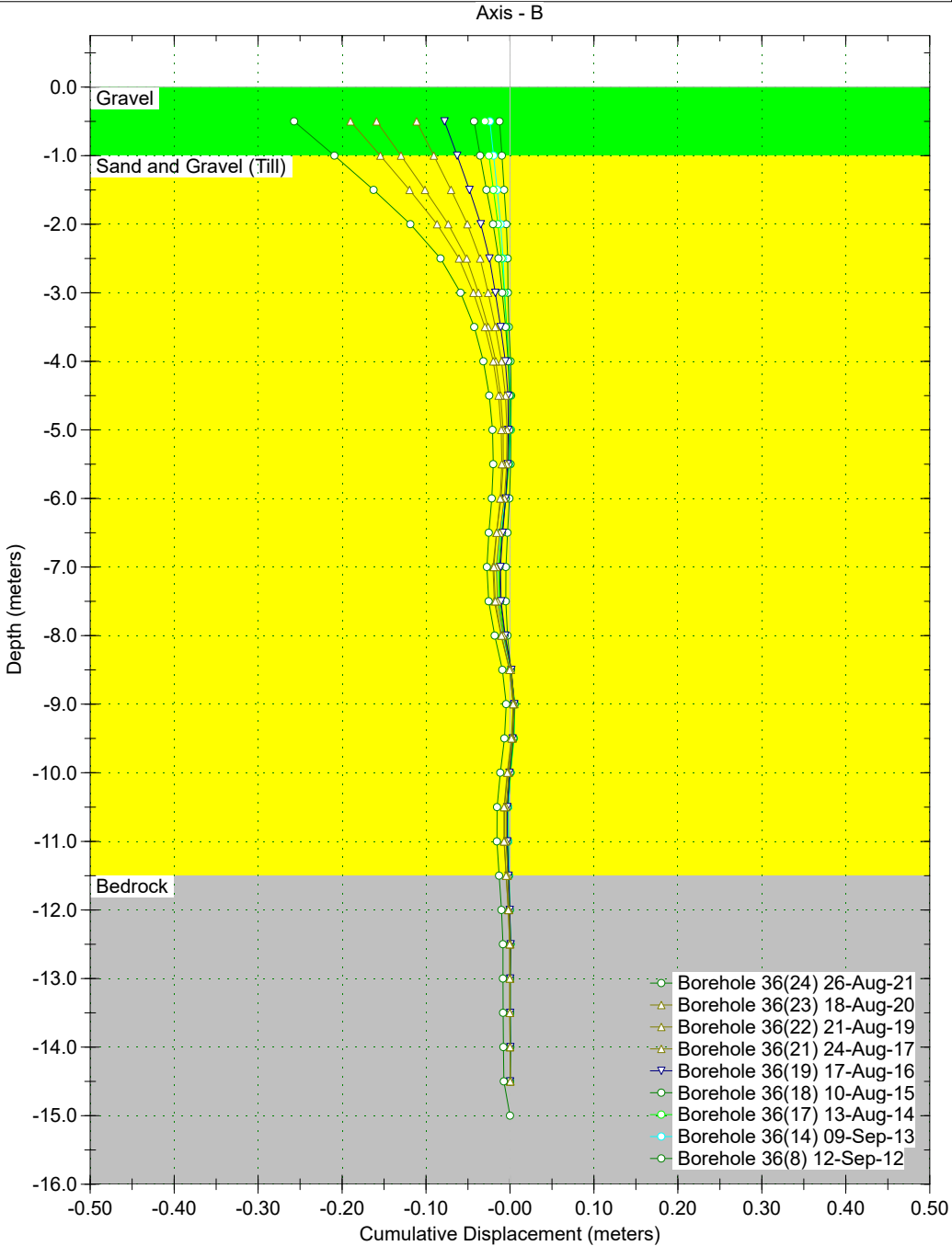
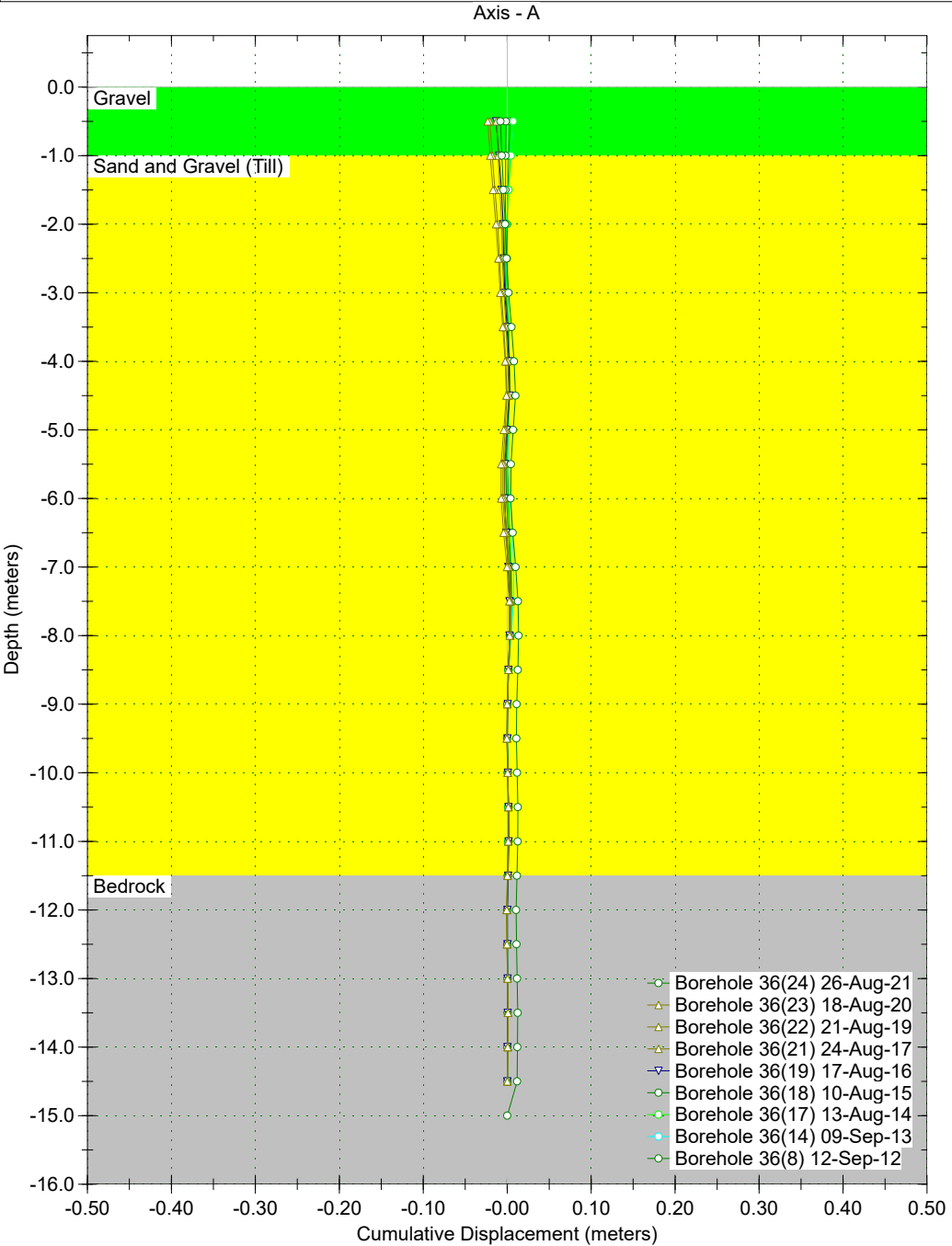
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH32
Figure T6

APPENDIX C

SLOPE INDICATOR PROFILE

Borehole : Borehole 36
Project : Keno Hill District Mill
Location : DSTF
Northing : 7086872
Easting : 483931
Collar : 908.1

Spiral Correction : N/A
Collar Elevation : 0.00 meters
Reading Depth : 14.5 meters
A+ Groove Azimuth : 165
Base Reading : 2011 Dec 14 16:52
Applied Azimuth : 0.0 degrees



APPENDIX B

2021 NOISE MONITORING RESULTS

Memorandum

To: Arlene Stearman, Alexco Keno Hill Mining Corp.

From: Robert Dekuysscher and Wes Moir, Ensero Solutions Canada Inc.

CC: Bryanna Gonari and Kai Woloshyn, Ensero Solutions Canada Inc.

Date: March 30, 2022

Re: 2021 Noise Monitoring Data Summary, Keno City, YT

Attachments: A – Keno Noise Monitoring Data September 2013 to November 2014
B – Keno Noise Monitoring Data December 2014 to December 2020

1 INTRODUCTION

As part of the Keno Hill Silver District Mining Operations Noise Monitoring and Management Plan (the Plan; AKHM, 2021), Alexco Keno Hill Mining Corp. (AKHM) monitors noise levels in the community of Keno City. The Plan was initially developed to address any potential noise effects that might occur with the addition of two proposed new mines, Lucky Queen and Onek 990. In addition to noise mitigation measures and the creation of a Noise Disturbance Notification Form and Noise Disturbance Register to track noise disturbance claims, AKHM committed to monitor noise levels within the community at various locations to assess the actual versus predicted noise levels and to determine if the noise abatement measures were effective.

The noise data collected between September 2013 to April 2018 provide a baseline for no active mining period for the Keno Hill Silver District (KHSD), although exploration and care and maintenance in the KHSD was ongoing throughout this period. Flame & Moth Mine development occurred from May to October 2018 and then AKHM returned to care and maintenance in November 2018. No mine development or milling activities took place close to Keno City until August 2020. Data collected during this second period of inactivity can be combined with baseline data. Exploration drilling was undertaken in the Bermingham area during this period. Any other noise activity detected in instrumentation at the site would be due to increased helicopter activities in response to the forest fire in the area during July and August 2019.

Mining activities resumed in Q4 of 2020 including development at Bellekeno, Flame & Moth and the Bermingham mines, and recommissioning the District Mill in December. Additionally, the Onek Water Treatment Plant was constructed August to September 2020 and began operating in September 2020. Further, new groundwater monitoring wells were drilled in the Bermingham, Dry Stack Tailings Facility (DSTF), and historic Onek 400 adit area in October and November 2020. In 2021, mining activities continued including the completion of the vent raise at the Bermingham Mine. The Bellekeno Mine was put in temporary closure in October 2021.

The predicted noise levels were presented in the Noise Impact Assessment (NIA) completed by Patching Associates Acoustical Engineering Ltd. (PAAE, 2014) conducted during the Yukon Environmental and Socio-Economic Assessment Act (YESAA) process (Project 2011-0315). The NIA identifies the noise sources from the current mining-related activities, noise receptors, and predicts the anticipated noise level from all existing sources and those associated with the addition of Lucky Queen and Onek 990 mining operations.

This memo presents noise monitoring results up until December 2021 with reference to the data collected since 2013.

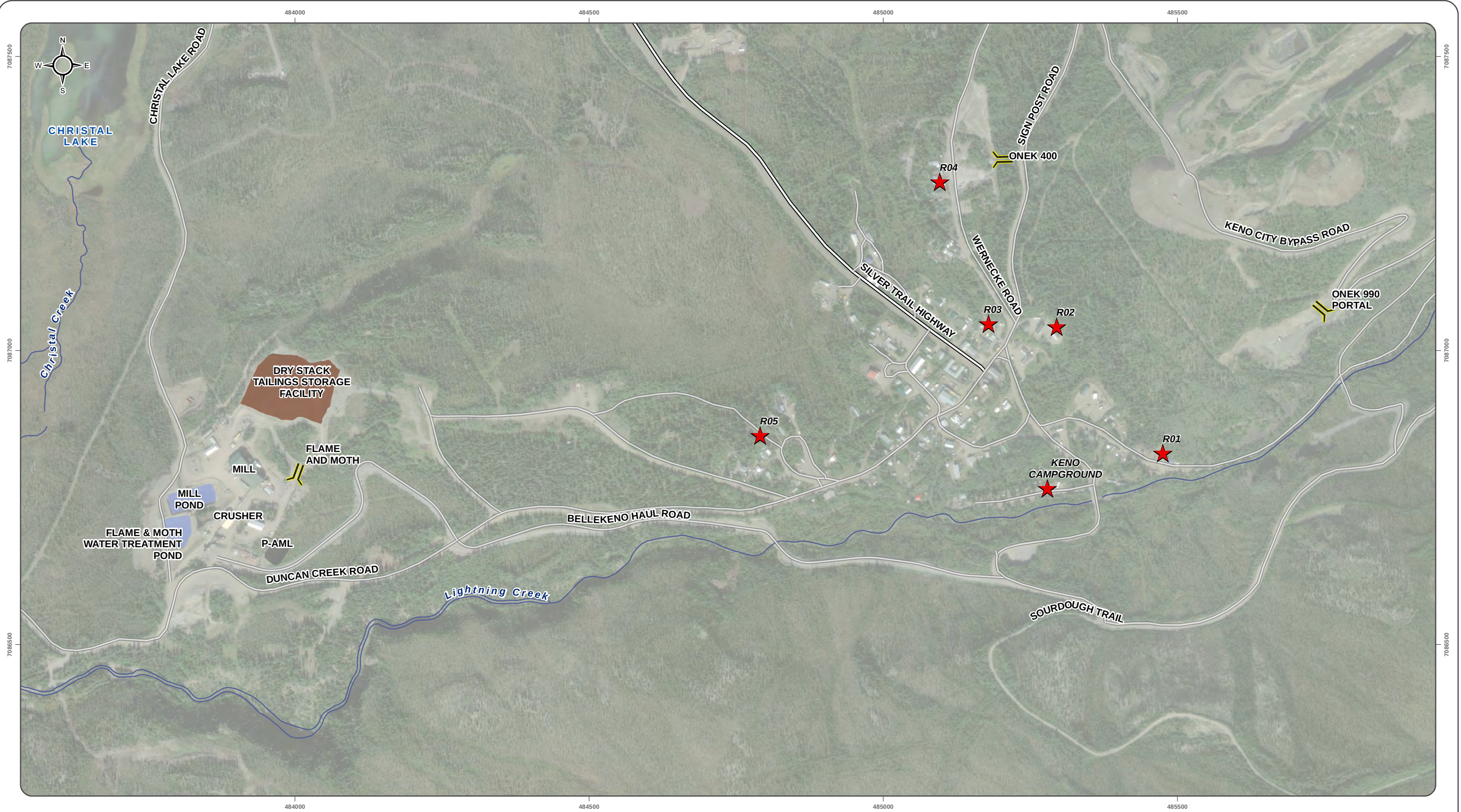
2 NOISE RECEPTORS

AKHM has monitored noise at the five locations selected in the NIA as being potential noise receptors within a 2 km radius study area around Keno City. Since November 2013, noise has also been monitored at a sixth location, the Keno City Campground. These monitoring locations are listed in Table 2-1 and shown in Figure 2-1.

Table 2-1: Representative Locations Assessed in Keno City

Monitoring Location	GPS Location	Description
R01	N63.90827 W135.29599	East end Residence, north side of Lightning Creek Road
R02	N63.91019 W135.29968	Residence, east side of Sign Post Road
R03	N63.91023 W135.30205	Town Center, north from the Snack Bar
R04	N63.91239 W135.30376	Residence, west side of Wernecke Road
R05	N63.90851 W135.30993	Residence, about 850 m east from the Mill
Campground	N63.90772 W135.29998	Keno City campground

The background noise levels at each monitoring location vary considerably and depend on climate parameters like relative humidity, temperature, and temperature inversions. These parameters influence how the receptors interpret sound level and propagation. For example, sound travels faster through hot air since hot air is less dense, resulting in different noise readings compared to a station situated in a cooler area. Humidity has a similar effect on noise. Dry air absorbs far more acoustical energy compared to moist air. Therefore, noise is expected to travel more efficiently in summer months when the ambient air is warmer and drier. The relationship between temperature and relative humidity is illustrated below in Figure 2-2.



Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on January 2021

Datum: NAD 83; Projection: UTM Zone 8N

This drawing has been prepared for the use of Ensero Solution's client and may not be used, reproduced or relied upon by third parties, except as agreed by Ensero Solutions and its client, as required by law or for use of governmental reviewing agencies. Ensero Solutions accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Ensero Solutions express written consent

1:6,000 (when printed on 11 x17 inch paper)

0 50 100 150 200 250 Meters

 Noise Monitoring Station

 Adit

 Current DSTF

 Pond

 Mine Feature Footprint

 Watercourse

 Silver Trail Highway

 Secondary Road



ALEXCO KENO HILL MINING CORP.

FIGURE 2-1

NOISE MONITORING STATIONS

JANUARY 2022

D:\Project\AllProjects\Keno_Area_Mines\ALL-SITES\02-Map\04-Studies\Air_Noise_Dust\Air_Quality_Noise_Mill_20210113.mxd
(Last edited by: tcsberg.1/13/2021/12:29 PM)

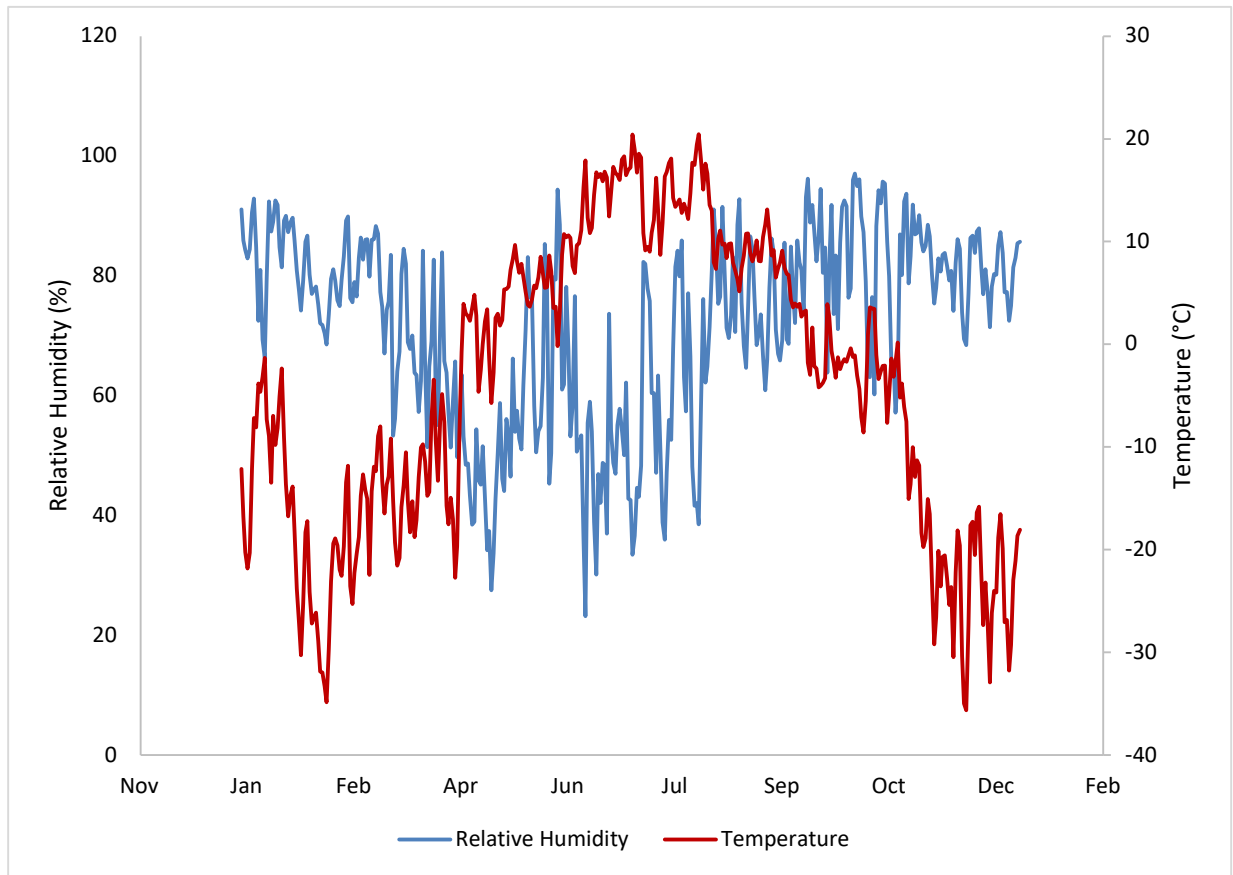


Figure 2-2: 2021 Daily Temperature and Relative Humidity at District Mill Meteorological Station

3 MINING ACTIVITIES TIMELINE

Mining took place at Bellekeno and milling at the District Mill throughout 2013 and were suspended on September 3, 2013. Advanced exploration at Onek 990 ceased at the end of May 2013. Exploration activities at Flame & Moth took place from late March to early November 2014. The remaining months: September 2013 through March 2014, and December 2014 to April 2018, can be considered baseline conditions as no mining or exploration activities occurred near Keno City at that time. Care and Maintenance as well as preparation of the Flame & Moth water treatment pond occurred in 2017. In 2018, Flame & Moth mine development occurred from May to October. In 2019, no mining or development occurred. However, some drilling in the Bermingham area occurred during the summer months, which is approximately 5 km away from Keno City on Galena Hill. AKHM was in ongoing Care and Maintenance from September 2013 to August 2020. Care and Maintenance activities included maintaining roads and other small construction activities in the District Mill area, and operating water treatment plants.

Construction of the Onek Water Treatment Plant commenced August 2020 and began operation at the end of September. Groundwater monitoring well drilling activities began in October 2020 in the Bermingham area and continued in Keno City near the Onek 400 adit and the DSTF area in November and around No Cash 500 in mid-November. Three new wells (KV-87, KV-108, and KC-MW-03N) were installed near town and nearby noise monitoring location R03 in October 2020. Mine development occurred at Flame & Moth and Bermingham in Q4 of 2020 and the mill was recommissioned in December 2020.

Details on construction activities in 2021 are described in the following sections.

3.1 MINE INFRASTRUCTURE

In 2021, the concrete foundation for the Flame & Moth ventilation raise was prepared and propane tank placed nearby. The footprint for the non-acid generating and/or metal leaching (N-AML) waste rock storage area was expanded by removing trees and overburden.

Surface construction activities at Bermingham included the construction of the temporary ore and potentially acid generating and/or metal leaching (P-AML) waste rock storage area; completion of one of two P-AML waste rock storage facilities, completion of the Bermingham vent raise and associated primary fan and heater and installation of a nearby propane tank. The Bermingham water treatment plant was upgraded to include an ammonia treatment plant. The site was connected to the regional electrical power grid and the diesel generator removed and a smaller backup generator installed.

3.2 ROAD CONSTRUCTION

In 2021 the Bermingham Haul Road was improved to safely accommodate ore haulage trucks. Improvements included grading and construction of run-away lanes, berms and widening to allow areas for light vehicles to pull off. No major upgrades occurred on the roads to Lucky Queen, Christal Lake Road, Keno City to Bellekeno Haul Road Bypass, or the Bellekeno Haul Road in 2021. Standard maintenance occurred throughout the year.

3.3 MILL SITE CONSTRUCTION

In 2021, a second office and dry facility were commissioned along with a warehouse and yard adjacent to the District Mill. The enclosure of the secondary crusher building, and dust suppression was completed and a new building to protect regrind mills from the elements constructed.

Ditches and culverts at the mill yard continued to be maintained to facilitate channeling melt water in the spring and storm events into to sediment basins. Organics from the construction of the warehouse yard were either stockpiled or used on the DSTF.

3.4 DRY STACK TAILINGS FACILITY

In 2021, liner was laid for additional tailings placement in accordance with the phase 1 DSTF design. Maintenance of the ditches and sumps were made in preparation for winter. Additional maintenance activities were completed in response to recommendations from the annual geotechnical inspection.

3.5 FLAT CREEK (ELSA) CAMP UPGRADES

The welcome center at the Flat Creek Camp was commissioned in 2021. Other upgrades included: the replacement and relocation of the propane tank; additional fire protection; and the demolition of an abandoned structure.

4 MONITORING EQUIPMENT

The noise monitoring profiles collected between April 2013 and November 2014 were measured using an Extech Integrating Sound Level Datalogger (Model 407780) to capture average decibels A (dBA) over a single ten-minute period. Wind speed, wind direction, temperature, and precipitation from the Flame & Moth Meteorological Station are reported alongside each noise monitoring event because weather can influence measured noise levels. Any noise sources associated with the monitoring event were also documented where possible. The results from 31 monitoring events from April 2013 to November 2014 are presented in Attachment A.

Starting in December 2014, noise monitoring readings were collected with a Casella CEL-63X Sound Level Meter and a Casella CEL-495 Microphone. The microphone was mounted on a tripod at approximately 1.5 meters above ground and was fitted with a windscreen to reduce wind impacts as required for outdoor sound measurements. The sound level meter and battery power source were housed inside a weather-proof case which was held in a locked metal box for extra security.

- In 2015, 24-hr period data were collected in January, as well as August through November. Equipment issues prevented the collection of 24-hr period data for the remainder of the year.
- In 2016, 24-hr period data were collected every month; however, not all stations could be monitored every month due to battery or other equipment issues, or the temperature being below operating conditions for the equipment.
- In 2017, a combination of equipment malfunction, equipment vandalism, and very cold temperatures only allowed for 24-hr period noise data collection in June, July, and November.
- In 2018, similar issues were encountered early in the year, samples were collected from March to December 2018.
- In 2019, 57 successful recording were captured from January to December 2019. Some recordings were missed due to battery issues, cold temperatures, and technical difficulties.
- In 2020, 38 recordings were captured from January to December 2020. 24-hr period data were collected every month except for September, October, and November; however, not all stations could be monitored every month due to battery issues, or the temperature being below operating conditions for the equipment.

In 2021 a Larson Davis Soundtrack LxT device was purchased to replace the broken Casella CEL-63X device. The Larson Davis device uses a PCB Piezotronics ½ inch pre-polarized free field microphone with an additional

preamplifier. The microphone was mounted on a tripod at approximately 1.5 meters above ground and fitted with a windscreen to reduce wind impacts. The sound level meter and battery power source were housed inside a weather-proof case.

- In 2021 no calibrations were performed due to supply chain issues associated with acquiring a calibration device.
- From January to October 2021 there were no sampling events due to a missing connection for the preamplifier to the handheld unit.
- Daily sampling events occurred in November and December when temperature and weather were within operational range (temperatures above -30 °C).
- In 2021, noise was monitored across 20 days beginning November 10 and ending December 30.

5 RESULTS

In 2021, a total of twenty 24-hr period sampling events took place. Noise monitoring was only conducted from November to December 2021 because of a missing preamplifier connection. Frequent sampling was conducted from November to December 2021 when temperature was within device operational range (temperatures above -30 °C).

Since a new device was used in 2021, there was a discrepancy in time weighting when setting up the device. The Larson Davis Soundtrack LxT was initially configured with a slow time weighting instead of a fast time weighting which was used from 2014-2020. This was corrected in December 2021 and future noise records will be captured using a fast time weighting.

The Larson Davis sound meter was not calibrated in 2021 due to supply chain issues associated with acquiring the calibration device. The meter should be calibrated before each monitoring event. Without calibration, the sound meter can drift and is more susceptible to temperature related measurement errors. If the drift is greater than ± 3.0 dB not all data is recorded. Since drift increases as temperature decreases, it is important to keep the sound level meter and microphone as warm as possible. During periods of extended low temperatures, the data validity may need to be assessed.

The LA_{eq} values from November to December 2021 ranged from 29.2 to 70.1 dB, with a median of 30.4 dB. The LA_{eq} is a measure of average received sound energy over time. If the LA_{eq} (average received sound) exceeds the LAS 10 (the sound level exceeded for 10% of the measurement period – louder or peak sounds), then the noise data is best characterized by short-term noise events, not general background noise. In 2021, the LA_{eq} exceeded the LAS 10 thirteen times (65% of measurements). Therefore, most of the noise detected around Keno in 2021 is attributed to short-term noise events.

The difference between the LA_{eq} and the LAS 90 (the sound level exceeded for 90% of the measurement period – quieter sounds) also indicates if the LA_{eq} has been influenced by short term noise events. If the difference between LA_{eq} and the LAS 90 is greater than 10 dB, then the LA_{eq} is influenced by short-term noise events. However, if the difference between LA_{eq} and the LAS 90 is less than 5 dB, then the LA_{eq} indicates a uniform background level of noise. In 2021, there were 5 monitoring events where the difference between LA_{eq} and the LAS 90 was greater than 10 dB.

Approximately 30% of the LA_{eq} measurements in 2021 exceeded the predicted levels from the NIA range (from 32 to 39 dB). Baseline noise levels were greater than those predicted in the NIA on several occasions between 2014 and 2016 as well, indicating that many of the notable noise sources are not linked to Keno mining or milling operations.

During November and December 2021, minimal mining development activities occurred near noise monitoring sites. There was also a decrease in noise monitoring events compared to previous years (only November and December data was collected). Lower sampling frequency in 2021 is due to missing equipment affecting the number of sampling events recorded.

Table 5-1 presents all 24-hr period noise data available in 2021 (all data runs with <24-hr have been excluded), and associated meteorological parameters obtained from the District Mill meteorological station (averaged from hourly data for the corresponding 24-hr period). The existing 2013 and 2014 ten-minute noise data measurements are provided in Attachment A. Attachment B presents all 24-hr noise data from December 2014 to December 2020, while Table 5-1 presents all 24-hr noise data from November 2021 to December 2021. 2021 data was kept separate from previous years because the data was captured with a slow time weighting instead of a fast time weighting.

All 24-hr noise recording results from 2014 to 2021 are presented in Figure 5-1 with the NIA values that were calculated in 2014 by PAAE. PAAE estimated that the Predicted Sound Levels with both ambient and day-time activities associated with the mine would be from 32 dBA at R03 to a maximum of 39 dBA at R01. PAAE also predicted an increase above current sound levels associated with the activity changes in Flame & Moth to be a maximum of 2 dB at R04 for both daytime and nighttime conditions. NIA is presented in all the following figures as a minimum of 32 dBA and a maximum of 39 dBA. As seen in Figure 5-1, the baseline data shows that PAAE overestimated noise levels during winter months when fewer activities are occurring and underestimated the summertime continuous noise levels. From November to December 2021, only 1 occurrence of continuous noise levels above the max NIA of 39 dBA was reported at R02.

In previous years some records did not have an associated station they were collected at; therefore, data for these monitoring events were averaged the LAeq values for the month and placed them under “unknown station”.

Figure 5-2 presents the current conditions measured in 2021 with NIA levels. In November LAeq values were uniform across all stations with the highest reading recorded at R01 (38.2 dB) and the lowest reading recorded at R03 (33.1 dB). In December, LAeq values were dissimilar with the highest reading recorded at R02 (70.1 dB) and the lowest reading recorded at R03 (29.3 dB). Mining activities were limited in December 2021 as Bellekeno Mine was closed and, therefore, the atypically high LAeq value recorded at R02 is likely associated with a non-mining activity (i.e., chain saw or motorized vehicle use). Peaks in continuous sound measurement (LAS 10) is also included in Figure 5-2. By comparing how many times the LAeq (average received sound) exceeds the LAS 10 (peak continuous sound events), we can determine the presence of significant short-term sound events.

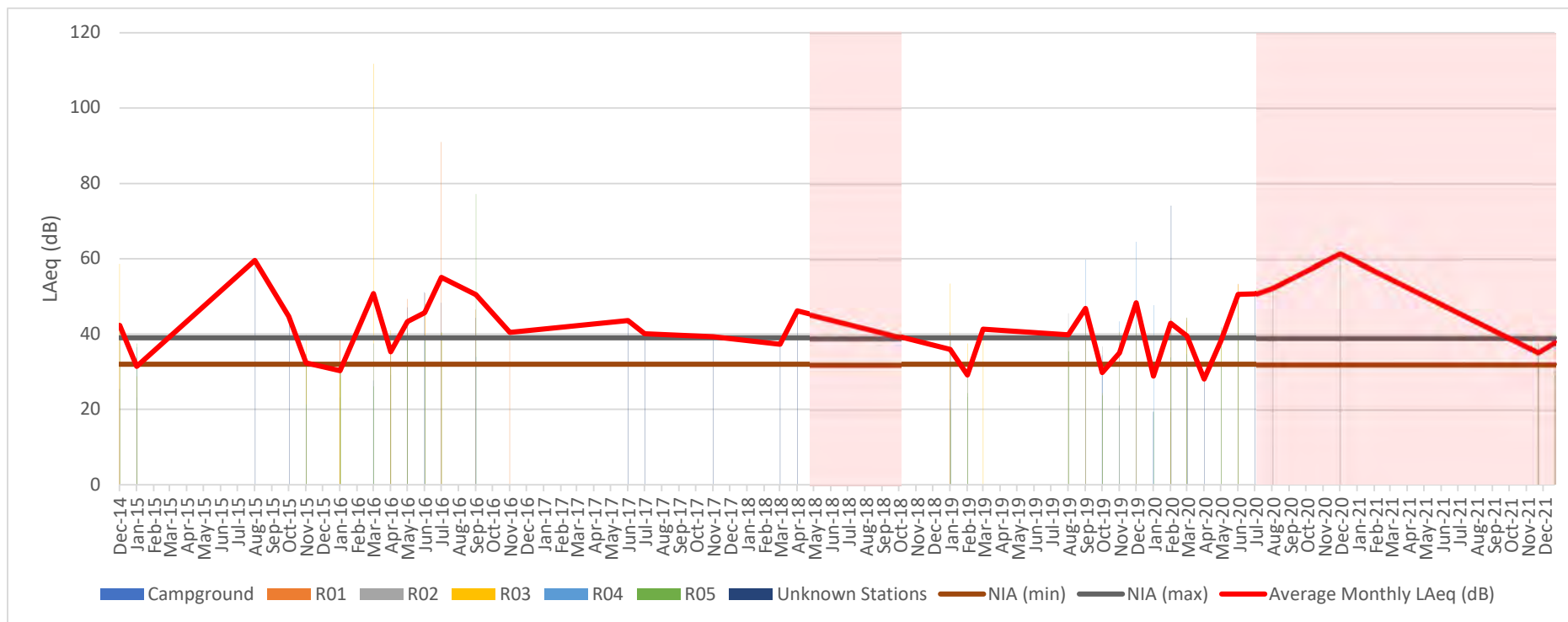
In 2018, a portion of the underground Flame & Moth decline was developed, hence blasting activities, material transportation and surface facility construction took place. May 2018 to October 2018 are considered operation noise data. As such, noise data collected before May 2018 or after October 2018 were considered baseline noise levels. August 2020 to present is considered operation noise data as mining activities have resumed.

Table 5-1: 2021 24-hr Noise Data and Corresponding Meteorological Data

Station	Start Date & Time	LASeq	LAS 10% (dB)	LAS 90% (dB)	LASeq > LAS 10	LASeq - LAS 90% (dB)	LASE	LCSeq (dB)	LASeq (dB)	LCSeq - LASeq (dB)	LAeq (dB)	LAeq (dB)	LAeq-LAeq (dB)	Calibration Drift (dB)	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
R03	10-Nov-21	33.1	33.2	27.2	No	5.9	82.4	44.1	33.1	11	39.8	33.1	6.7	N/A	-13.65	83.20	1.69
Campground	11-Nov-21	37.3	39.7	26.4	No	10.9	86.7	39.8	37.3	2.5	41.5	37.3	4.2	N/A	-10.02	91.90	1.01
R04	12-Nov-21	37.6	31.9	26.8	No	10.8	87	46.7	37.6	9.1	46.5	37.6	8.9	N/A	-12.93	86.90	0.79
R02	13-Nov-21	31.8	28.2	26.6	No	5.2	81.2	42.6	31.8	10.8	40.7	31.8	8.8	N/A	-11.30	87.10	0.68
R01	14-Nov-21	38.2	28.9	26.5	No	11.7	87.6	51.7	38.2	13.4	45.4	38.2	7.1	N/A	-11.79	90.10	0.67
R05	16-Nov-21	33.2	27.3	26.5	No	6.7	82.6	46	33.2	12.8	42.8	33.2	9.6	N/A	-19.76	84.10	0.21
R01	2-Dec-21	38.9	27.2	26.5	No	12.4	88.3	38.9	47.9	8.9	47.5	38.9	8.6	N/A	-18.12	86.10	0.36
R02	7-Dec-21	70.1	71.9	54.4	Yes	15.7	93.3	82.4	70.1	12.3	81.9	70.1	11.8	N/A	-27.36	76.90	0.38
R03	8-Dec-21	29.3	29.4	29.3	Yes	0.0	78.7	29.7	29.3	0.4	29.5	29.3	0.2	N/A	-17.62	86.30	0.33
R04	9-Dec-21	29.4	29.5	29.3	Yes	0.1	78.8	29.7	29.4	0.3	29.6	29.4	0.2	N/A	-17.30	86.70	0.38
R05	10-Dec-21	29.5	29.5	29.4	Yes	0.1	78.8	29.8	29.5	0.3	29.6	29.4	0.2	N/A	-20.52	83.80	0.18
Campground	18-Dec-21	30.4	30.6	30.2	Yes	0.2	79.8	31.4	30.4	1.0	31.2	30.4	0.8	N/A	-26.18	78.18	0.11
R04	19-Dec-21	30.4	30.6	30.3	Yes	0.1	79.8	31.6	30.4	1.1	31.4	30.4	1.0	N/A	-24.03	80.30	0.18
R02	20-Dec-21	30.4	30.6	30.3	Yes	0.1	79.8	31.5	30.4	1.1	31.3	30.4	0.9	N/A	-24.17	80.20	0.13
R03	21-Dec-21	30.1	30.6	29.3	Yes	0.8	79.4	30.9	30.1	0.9	30.8	30.1	0.7	N/A	-18.86	85.10	0.60
R03	24-Dec-21	29.4	29.6	29.2	Yes	0.2	78.7	29.7	29.4	0.3	29.6	29.4	0.2	N/A	-27.09	77.25	0.39
R05	25-Dec-21	29.2	29.3	29.1	Yes	0.1	78.5	29.5	29.2	0.4	29.4	29.2	0.2	N/A	-26.87	77.31	0.71
Campground	27-Dec-21	29.5	29.7	29.4	Yes	0.1	78.9	29.8	29.5	0.3	29.7	29.5	0.2	N/A	-29.28	74.99	0.07
R04	28-Dec-21	29.5	29.5	29.4	Yes	0.1	78.8	29.8	29.5	0.3	29.6	29.4	0.2	N/A	-22.97	81.40	0.39
R02	30-Dec-21	29.4	29.5	29.4	Yes	0.0	78.8	29.7	29.4	0.3	29.6	29.4	0.2	N/A	-18.65	85.40	0.02

Legend:

Yes	When LAeq > LAS 10
<5	LAeq – LAS 90 (dB) less than 5
>10	LAeq – LAS 90 (dB) greater than 10



Active Mining

Figure 5-1: All 24-hr Noise Recording Results from 2014-2021 Presented with the Noise Impact Assessment (NIA) Values

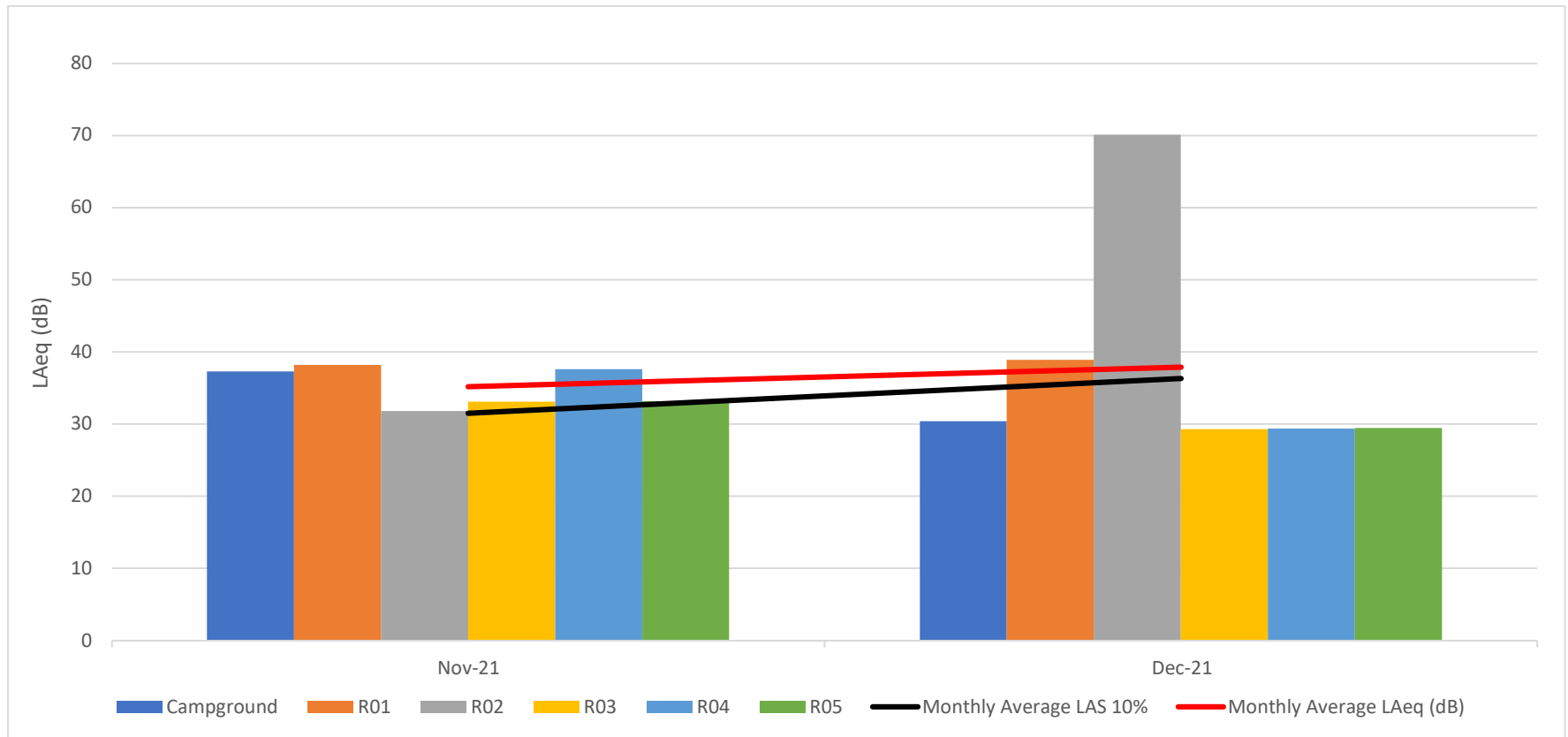


Figure 5-2: 2021 Noise Levels and Monthly Average

6 NOISE COMPLAINTS

No formal noise complaints were received by AKHM in 2021.

7 RECOMMENDATIONS

Consistent monitoring, faulty equipment, and device calibration were the major concerns stemming from the 2021 monitoring season. In 2022, a consistent monitoring schedule should be followed to collect robust noise data which can then be used to track noise trends. Additionally, the device should be calibrated each time the device is moved (i.e., before each monitoring event).

8 CONCLUSION

Noise levels measured at most noise receptors were within or below the 20-60 dBA range deemed to be acceptable for daytime noise limits, except for the December 7, 2021 L_{Aeq} reading at R02. However, this reading was collected when a mining crew shift change when limited mining activities take place; therefore is likely associated with a non-mining activity (i.e., chain saw or motorized vehicle use). NIA values developed in 2014 were generally overestimated in winter months and underestimated in summer months but remain a valid comparative measure for noise data. Overall, 5% of the 24-hr recordings exceeded the maximum NIA threshold of 39 dB. Also, in 2021 the L_{Aeq} exceeded the LAS 10 thirteen times (65%). Therefore, most of the noise detected around Keno in 2021 is attributed to short-term noise events rather than background noise. In 2022 continued monthly monitoring over a 24-hr interval is needed to better inform noise monitoring thresholds and noise trends.

9 REFERENCES

- AKHM (Alexco Keno Hill Mining Corp.). (2021). Noise Monitoring and Management Plan, Keno Hill Silver District Mining Operations, October 2021.
- PAAE (Patching Associates Acoustical Engineering Ltd.). (2014). *Noise Impact Assessment Update, Alexco Keno Hill Mining Corp., Proposed Flame and Moth Mine Project, Yukon Territory*. Prepared for Yukon Environmental and Socio-Economic Assessment Board (YESAB), September 23, 2014.

ATTACHMENT A:
KENO NOISE MONITORING DATA SEPTEMBER 2013 TO
NOVEMBER 2014

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
08/04/2013	R01	12:26	2	Windy SSE	None	52.0	
08/04/2013	R02	12:05	2	Windy SSE	None	58.6	
08/04/2013	R03	11:45	2	Windy SSE	None	52.4	
08/04/2013	R04	11:25	2	Windy SSE	None	67.2	A dog barked 2 times.
08/04/2013	R05	11:04	2	Windy SSE	None	48.5	
10/04/2013	R01	11:33	-6	Light SSW	None	42.1	
10/04/2013	R02	13:00	-6	Light SSW	None	42.5	
10/04/2013	R03	12:40	-6	Light SSW	None	49.0	Doors slamming. People talking.
10/04/2013	R04	12:20	-6	Light SSW	None	39.4	
10/04/2013	R05	12:00	-6	Light SSW	None	39.1	
06/05/2013	R01	15:30	2	Wind West	None	35.1	Backup alarm at Onek. Tarps flapping in wind.
06/05/2013	R02	15:30	2	Slight breeze	None	34.4	
06/05/2013	R03	15:30	2	Windy	None	44.8	Dog barking. Boart truck.
06/05/2013	R04	15:30	2	Slight breeze	None	32.8	
06/05/2013	R05	15:30	2	Slight breeze	None	37.5	Dog barking.
19/05/2013	R01	10:25	-2	Light (<10km/h) N	Light snow	69.6	Creek flowing loud. Squirrels making noise. Tarp flapping. Volvo going by on the BKR.
19/05/2013	R02	10:10	-2	Light (<10km/h) E	Light snow	43.2	Creek flowing below. A few birds chirping. Boart pickup went by.
19/05/2013	R03	9:55	-2	Light (<10km/h) E	Light snow	56.3	A few birds. Talking and trucks in town in the distance. Water truck went by.
19/05/2013	R04	9:30	-2	Light (<10km/h) E	Light snow	46.6	Lots of birds calling and a woodpecker pecking close by.
19/05/2013	R05	8:55	-2	Light (<10km/h) E	Light snow	36.4	A few birds and a squirrel chirping.
18/06/2013	R01	16:25	22	Light (<10km/h) S	None	48.6	Creek flowing. Leaves rustling.
18/06/2013	R02	16:10	22	Light (<10km/h) S	None	46.8	Volvo on BKR. 2 vehicles drove past. Gusts of wind rustling trees. Chainsaw nearby in town.
18/06/2013	R03	15:55	22	Light (<10km/h) S	None	44.8	People talking and walking close by. 2 Vehicles driving through town and 1 driving by.
18/06/2013	R04	15:40	21	Light (<10km/h) S	None	34.9	Wind rustling leaves. Birds calling.
18/06/2013	R05	14:55	21	Light (<15km/h) S	None	37.6	Wind rustling leaves. Volvo on the BKR.
24/07/2013	R01	11:07	23	light (<20km/h) S	None	48.7	Leaves rustling. Creek nearby. Birds chirping.
24/07/2013	R02	10:55	23	light (<10km/h) S	None	40.4	Three vehicles driving nearby. Leaves rustling.
24/07/2013	R03	10:43	23	light (<10km/h) S	None	47.7	Backup alarm at Mill. Leaves rustling. Someone in town hammering. Two vehicles drove by.
24/07/2013	R04	10:30	23	light (<10km/h) SE	None	38.0	Backup alarm at Mill. Mill crusher. Leaves rustling. Car drove by twice. Car on Silver Trail.
24/07/2013	R05	10:14	23	Calm	None	38.0	Backup alarm at Mill. Volvo down BKR. Mill crusher.
16/11/2013	R01	14:11	-20	Calm	None	27.8	Birds.
16/11/2013	R02	13:51	-20	Calm	None	31.9	Squirrel, ravens, birds noise.
16/11/2013	R03	13:35	-20	Calm	None	34.9	Squirrel, ravens, birds noise+ truck.
16/11/2013	R04	13:20	-20	Calm	None	40.6	Lots of ravens activity, birds.
16/11/2013	R05	14:27	-20	Calm	None	38.1	Birds, truck plus door slamming + humain voive + dog barking. All at about 200 meters from sound meter.
17/11/2013	R01	12:46	-30	Calm	None	25.4	Birds.
17/11/2013	R02	12:25	-30	Calm	None	27.6	Birds, squirrel and vehicle.
17/11/2013	R03	12:07	-30	Calm	None	31.1	Ravens, squirrel and vehicle.
17/11/2013	R04	11:48	-30	Calm	None	35.9	Ravens.
17/11/2013	R05	13:01	-30	Calm	None	23.8	Quiet.
29/11/2013	Cmpgrnd	15:08	-23	Calm	None	26.4	Chainsaw in town, birds chirping.
29/11/2013	R01	14:52	-23	Calm	None	27.4	Birds chirping, snowmobile in distance.
29/11/2013	R03	14:36	-23	Calm	None	46.7	Ravens, chainsaw and dog barking in the distance, water truck drove by and backed up (alarm) nearby.
29/11/2013	R04	14:20	-23	Calm	None	29.0	squirrels and little birds in distance, ravens flying by, someone coughing, doors closing nearby, dog barking.
29/11/2013	R05	13:59	-24	Calm	None	30.7	Raven calling, snowmobile in distance, squirrel nearby.
13/12/2013	Cmpgrnd	10:55	-20	N-W Calm	None	25.2	Quiet, birds signing once.
13/12/2013	R01	10:35	-20	N-W Calm	None	24.4	Quiet.
13/12/2013	R02	10:17	-20	N-W Calm	None	32.1	Raven, birds, squirrel.
13/12/2013	R03	10:02	-20	N-W Calm	None	27.3	Raven, birds, squirrel.
13/12/2013	R04	9:44	-20	N-W Calm	None	31.2	Raven flying and walking around. Birds signing.
13/12/2013	R05	11:13	-20	N-W Calm	None	27.1	Quiet, squirrel.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
31/12/2013	R05	13:52	-18	calm	None	30.7	A few little birds chirping.
31/12/2013	R04	14:06	-18	Calm	None	44.0	lots of ravens flying, calling. Dog chewing on bone nearby. Person walking by, closing door.
31/12/2013	R03	14:20	-17	Light (<10km/h)S	None	35.8	Two vehicles drove through town. Flagpole dinging in the wind. People talking, walking in town.
31/12/2013	R01	14:34	-17	Calm	None	26.4	Little birds chirping. Raven flew by.
31/12/2013	Cmpgrnd	14:49	-17	Calm	None	25.2	Ravens calling in distance. Someone coughing. Little birds chirping.
20/01/2014	R04	14:04	-14	Calm	None	49.8	Distant grader. Birds. Vehicle.
20/01/2014	R03	14:24	-13	Calm	None	45.6	Distant grader. Birds.
20/01/2014	Cmpgrnd	14:39	-13	Calm	None	30.7	Distant grader.
20/01/2014	R01	15:13	-14	Calm	None	38.8	Distant grader. Vehicle.
20/01/2014	R05	14:56	-14	Calm	None	68.1	Grader went by.
29/01/2014	R05	15:07	-12	Calm	None	26.6	Squirrels, whiskeyjack calling nearby.
29/01/2014	R04	15:23	-12	Calm	None	33.5	Small bird chirping, ravens calling and flying by.
29/01/2014	R03	15:36	-12	Calm	None	41.1	Ravens calling, truck driving by, squirrel chatting, small bird chirping.
29/01/2014	R01	15:50	-12	Calm	None	26.1	Squirrel chatting, door closing in distance, birds calling, neighbour getting firewood.
29/01/2014	Cmpgrnd	16:06	-12	Calm	None	23.5	Squirrel chatting, bird chirping, ravens flying over and calling.
05/02/2014	R05	12:55	-20	light (5km/h)	None	28.4	Raven calling, squirrel chattering.
05/02/2014	R04	13:12	-20	light(<5km/h)	None	31.2	Small bird chirping, ravens calling and flying, door closing in distance X3, neighbour getting firewood.
05/02/2014	R03	13:27	-20	light(<5km/h)	None	26.5	Ravens calling in distance. Squirrel chattering, small birds, truck creaking.
05/02/2014	R01	13:40	-18	light(<5km/h)	None	43.0	Squirrel chattering, ice inside old dump truck (beside sample site) cracked loudly, birds chirping.
05/02/2014	Cmpgrnd	13:59	-19	light(<5km/h)	None	26.0	Small birds chirping, ravens in distance.
26/02/2014	R05	14:14	-9	Calm	None	32.5	Water truck running nearby, driving. Squirrel chattering, little birds calling.
26/02/2014	R04	14:31	-8	Calm	None	35.4	Ravens calling, person walking by and into house.
26/02/2014	R03	14:56	-8	Calm	None	30.9	Lots of squirrels chattering, dog barking in distance, small birds chirping, radio from neighbours house, raven calling.
26/02/2014	R01	15:10	-8	Calm	None	27.7	Little birds chirping. Squirrels.
26/02/2014	Cmpgrnd	15:26	-8	Calm	None	31.2	Someone chainsawing in town. Birds chirping.
05/03/2014	R05	14:19	-14	Calm	None	28.0	Raven calling in distance. Lots of little birds chirping nearby.
05/03/2014	R04	14:37	-14	Slight breeze	None	30.1	Ravens calling nearby. Squirrels chattering. Helicopter in distance. Little birds chirping. Ravens flying by.
05/03/2014	R03	14:50	-13	light (<10km/h)	None	40.1	Vehicle in town idling. Lots of little birds chirping. Raven calling. Flags tinging on flagpoles. Helicopter in distance.
05/03/2014	R01	15:04	-13	calm	None	26.9	lots of little birds chorping. Rvens in distance. Helicopter faintly in distance.
05/03/2014	Cmpgrnd	15:19	-14	very slight breeze	None	28.5	little birds chirping. Ravens in distance. Helicopter in distance. Backup alarm in town.
29/03/2014	R05	14:31	-3	Slight breeze	None	28.7	Lots of small birds calling nearby. Squirrel chattering.
29/03/2014	R04	14:48	0	light (10 km/h)	None	34.8	Ravens calling closeby. Small birds calling. Diamond drill and equipment working in distance. Wind chimes. Someone scraping snow.
29/03/2014	R03	15:00	0	light (10 km/h)	None	29.8	Flags hitting flagpoles. Lots of small birds calling nearby. Raven calling. Squirrel chattering. Squirrel climbing on sign nearby.
29/03/2014	R01	15:13	0	Slight breeze	None	31.3	Small birds. Squirrel chattering. Steel pipe made sound as it expanded.
29/03/2014	Cmpgrnd	15:34	0	Slight breeze	None	27.6	Small birds calling. Bulldozer (drillers) going down Duncan creek road in distance. Someone working on something in town. Raven calling.
09/04/2014	R01	10:04	-10	Calm	None	45.9	Pickup , backup alarm. Birds.
09/04/2014	R02	9:55	-10	Calm	None	44.7	Water truck x 2, delivering.
09/04/2014	R03	9:24	-10	Calm	None	29.8	Water truck x 2, delivering.
09/04/2014	R04	9:00	-10	Calm	None	33.8	Ravens.
09/04/2014	R05	10:47	-10	Calm	None	28.0	Ravens.
09/04/2014	Cmpgrnd	10:32	-10	Calm	None	25.2	Squirrel.
18/04/2014	R01	15:43	2	Calm	None	32.0	Birds, loader, backup alarm far away.
18/04/2014	R02	16:22	2	Calm	Snow/rain	30.0	Car, birds.
18/04/2014	R03	15:20	2	Calm	Snow	61.4	Loader, backup alarm. Car +horn. People talking, dog barking.
18/04/2014	R04	15:04	2	Calm	Snow	36.2	Ravens, birds.
18/04/2014	R05	16:37	2	Calm	None	31.6	Birds.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
18/04/2014	Cmpgrnd	15:04	2	Calm	Rain/snow	34.2	Birds.
11/05/2014	R01	9:14		strong N wind	None	45.7	Birds, creek.
11/05/2014	R02	8:58		Light N wind	None	40.7	Birds, car, house doors slamming.
11/05/2014	R03	8:42		Light N wind	None	40.3	Birds.
11/05/2014	R04	8:27		calme	None	34.4	Birds.
11/05/2014	R05	10:21		Light N wind	None	38.8	Wind in trees, bear or moose cracking branches.
11/05/2014	Cmpgrnd	9:30		Light N wind	None	52.4	Creek.
29/05/2014	R01	10:50		Light SW wind	None	43.4	Creek.
29/05/2014	R02	10:30		Light SW wind	None	31.5	Raven, truck.
29/05/2014	R03	9:50		Light SW wind	None	44.3	Raven, car, truck running idle, starting.
29/05/2014	R04	9:40		Light SW wind	None	33.6	Ravens.
29/05/2014	R05	11:40		Light SW wind	None	32.7	Birds.
29/05/2014	Cmpgrnd	11:20		Light SW wind	None	47.9	Creek.
01/06/2014	R01	15:49		strong wind all directions	None	46.1	Creek, wind, dog barking.
01/06/2014	R02	15:33		strong wind all directions	None	36.8	Doors slamming x 2.
01/06/2014	R03	15:20		strong wind all directions	None	40.8	Truck, trailer, horn.
01/06/2014	R04	15:03		light wind all directions	None	31.8	ATV far away.
01/06/2014	R05	16:18		strong wind all directions	None	35.7	Silent.
01/06/2014	Cmpgrnd	16:03		strong wind all directions	None	50.0	Creek.
26/06/2014	R01	12:52		strong N wind	None	47.0	Wind in trees,creek, birds.
26/06/2014	R02	12:38		strong N wind	None	57.3	Wind in trees, car, chainsaw, ravens, people talking.
26/06/2014	R03	12:25		N wind	None	49.0	Wind in trees, ATV, music, car, ravens.
26/06/2014	R04	12:09		N wind	None	33.5	Wind in trees, birds.
26/06/2014	R05	13:30		N wind	None	42.3	Wind in trees, birds.
26/06/2014	Cmpgrnd	13:11		N wind	None	50.5	Wind in trees, creek.
05/08/2014	R01	10:14		N wind	None	42.8	Wind in trees, creek, birds.
05/08/2014	R02	9:51		N wind	None	34.6	Truck running, people talking, door slamming, wind.
05/08/2014	R03	9:33		N wind	None	39.6	Truck running, people talking, wind.
05/08/2014	R04	9:19		N wind	None	38.7	Car starting, door slamming,, car passing by, wind.
05/08/2014	R05	11:47		N wind	None	36.9	Wind in willows.
05/08/2014	Cmpgrnd	11:17		N wind	None	46.1	Creek, wind, people talking.
23/08/2014	R01	13:36		N wind	None	45.1	Creek, house building.
23/08/2014	R02	13:19		N wind	None	67	Pickup truck, motor running.
23/08/2014	R03	13:07		N wind	None	32	Dog barking x 2, vehicles.
23/08/2014	R04	12:43		N wind	None	36.3	Ravens.
23/08/2014	R05	15:44		N wind	None	38.6	Dump truck, vehicles, drill far away.
23/08/2014	Cmpgrnd	13:54		N wind	None	48.9	Creek, vehicles.
03/09/2014	R01	16:01		W wind, strong	None	49.9	Wind + creek.
03/09/2014	R02	15:47		W wind, strong	None	47.8	Dogs barking, ATV's, wind, door slamming.
03/09/2014	R03	15:35		W wind, strong	None	52.7	2 trucks drove by, dogs barking, wind.
03/09/2014	R04	15:22		W wind, strong	None	37.9	Wind, ravens.
03/09/2014	R05	16:29		W wind, strong	None	41.6	Drill, wind.
03/09/2014	Cmpgrnd	16:15		W wind, strong	None	51.1	Wind, creek, vehicles.
18/09/2014	R01	16:02		NW little wind	None	45.3	Strong wind, creek.
18/09/2014	R02	15:48		NW little wind	None	53.9	ATVs, birds.
18/09/2014	R03	15:35		NW little wind	None	39.2	ATVs, birds.
18/09/2014	R04	15:22		NW little wind	None	32.5	Birds.
18/09/2014	R05	16:30		NW little wind	None	43.1	Little wind, leaves in wind.
18/09/2014	Cmpgrnd	16:15		NW little wind	None	48.9	Strong wind, creek.
15/10/2014	R01	14:28		No Wind	None	42.5	Creek, ravens, birds.
15/10/2014	R02	14:14		No Wind	None	46.7	Car, ravens, birds, squirrels.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
15/10/2014	R03	14:00		No Wind	None	40.2	Car, ravens.
15/10/2014	R04	13:40		No Wind	None	29.6	Squirrel, birds, door slamming.
15/10/2014	R05	15:31		No Wind	None	28.8	Ravens, birds.
15/10/2014	Cmpgrnd	14:46		No Wind	None	45.7	Creek, ravens, birds.
25/10/2014	R01	9:33		No Wind	None	38.0	Calm, creek, ravens, birds.
25/10/2014	R02	9:08		No Wind	None	30.2	Calm, ravens, birds.
25/10/2014	R03	8:53		No Wind	None	27.8	Calm, ravens, birds.
25/10/2014	R04	8:37		No Wind	None	31.0	Calm, ravens, birds.
25/10/2014	R05	10:36		No Wind	None	39.2	Calm, ravens.
25/10/2014	Cmpgrnd	10:22		No Wind	None	38.3	Calm, creek, ravens.
14/11/2014	R01	10:57		No Wind	None	67.4	Water truck, squirrel, creek.
14/11/2014	R02	10:37		No Wind	None	33.8	Calm.
14/11/2014	R03	10:10		No Wind	None	37.8	Car x 2.
14/11/2014	R04	9:56		No Wind	None	31.6	Ravens, calm.
14/11/2014	R05	11:30		No Wind	None	33.3	Calm.
14/11/2014	Cmpgrnd	11:12		No Wind	None	38.2	Creek, truck.
23/11/2014	R01	9:45		No Wind	None	26.5	Squirrel.
23/11/2014	R02	9:22		No Wind	None	27.9	Ravens.
23/11/2014	R03	9:01		No Wind	None	53.9	Ravens, truck x2.
23/11/2014	R04	8:46		No Wind	None	40.7	Ravens, truck idling.
23/11/2014	R05	10:12		No Wind	None	33.3	Ravens.
23/11/2014	Cmpgrnd	9:58		No Wind	None	22.7	Ravens.
01/12/2014							Noise Monitoring converted to 24 hours from 10 min measurements in December 2014

*All readings are taken using an Extech integrating sound level datalogger model 407780 to measure DBA for 10 min. Reading from 16/11/13 taken with an Casella CEL-63X model.(Laeq, Db.)

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Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF 10	LAeq - LAF 90% (dB)	Lzeq (dB)	LAleq (dB)	LAE (dB)	LCeq (dB)	LCeq-LAeq (dB)	Calibration Drift (dB)	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
R01	2014-12-14 10:30	43.1	N/A	N/A			72.7	45.3	92.4	59.4	16.4	-4.8	-4.4	92.6	n/a
R02	2014-12-15 16:20	44.3	N/A	N/A			77.1	49.6	93.7	64.3	20	-4.8	-1.9	76.4	1.35
R03	2014-12-17 10:00	58.6	N/A	N/A			59.4	62	108	59.2	0.6	-4.8	-8.4	94.4	0.7
R05	2014-12-18 10:30	42	N/A	N/A			50.6	45.2	91.3	48.5	6.6	-4.8	-13.6	90.7	0.6
Campground	2014-12-22 12:30	25.4	N/A	N/A			43.5	27.4	74.8	38	12.6	-4.8	-9.6	93.8	n/a
R01	2015-01-10 10:15	28.8	N/A	N/A			38.2	33.4	78.2	35.6	6.8	-4.8	-10.2	93.7	n/a
R02	2015-01-11 15:50	33.8	N/A	N/A			43.8	36	83.2	40.3	6.5	-4.8	-10.1	93.3	n/a
R03	2015-01-13 8:40	28.6	N/A	N/A			40.7	31.6	78	37.9	9.3	---	-7.3	95.3	n/a
R04	2015-01-14 9:45	36.5	N/A	N/A			51.4	41.8	85.9	47.6	11.1	-4.8	-9.4	93.9	n/a
R05	2015-01-15 12:30	37.5	N/A	N/A			47.8	42.1	86.9	41.1	3.6	-4.8	-1.8	99	0.52
Campground	2015-01-22 8:30	23.2	N/A	N/A			28	23.4	72.6	22.5	-0.7	---	-9.8	93.6	0.47
N/A	2015-08-13 11:00	34.2	35.5	22.5	No	11.7	56.1	36.6	83.6	51.4	17.2	0.3	8.6	63.3	1.57
N/A	2015-08-14 13:30	111.8	116	45.5	No	66.3	123.9	119.1	161.2	118	6.2	0.3	9.7	68.4	1.68
N/A	2015-08-16 14:00	49.2	48	46.5	Yes	2.7	62.6	52.6	98.6	61.3	12.1	0.3	11.3	67.5	1.56
N/A	2015-08-23 11:00	60.6	61	60	No	0.6	62.7	61.2	110	62	1.4	0.3	8.3	84	1.38
N/A	2015-08-24 13:00	41.9	38.5	20.5	Yes	21.4	54.1	47.2	91.3	52	10.1	0.3	7.7	87.2	0.95
N/A	2015-09-12 10:00	---	8.5	8			---	---	57.7	---	-1.1	0.3	4.6	79.4	1.73
N/A	2015-09-14 10:15	---	8.5	8			---	---	57.7	---	-1.1	0.3	3.3	87.8	1
N/A	2015-09-15 10:30	---	8.5	8			---	---	57.7	---	-1.1	0.3	1.4	93.6	1.09
N/A	2015-09-17 6:00	---	8.5	8			---	---	57.7	---	-1.1	0.3	5.2	84.6	1.58
N/A	2015-09-18 13:15	---	8.5	8			---	---	57.6	---	-1.1	0.3	2.5	81.2	1.65
N/A	2015-10-17 12:40	30.4	31.5	20	No	10.4	44.8	35.8	79.8	40.5	10.1	0.3	3.3	94.8	0.76
N/A	2015-10-18 16:33	58.9	59.5	58.5	No	0.4	61	59.4	108.3	59.8	0.9	0.3	4.1	85.3	0.84
R05	2015-11-14 11:30	32.8	17	15	Yes	17.8	42.4	33.6	82.2	39.2	6.4	0.3	-18.4	86.5	n/a
R01	2015-11-16 8:30	34.7	19.5	16	Yes	18.7	51.2	37	84	49.2	14.5	0.3	-17.4	87.3	n/a
R04	2015-11-17 10:00	21.3	18	15.5	Yes	5.8	46.4	27.3	70.6	36.3	15	0.3	-21	83.9	n/a
R02	2015-11-19 9:00	33.1	16	15.5	Yes	17.6	46.9	40.3	82.4	44.2	11.1	0.3	-28.4	76.7	n/a
R03	2015-11-21 9:40	39.7	17.5	16	Yes	23.7	47.8	46	89	46.3	6.6	0.3	-9	94	n/a
Campground	2016-01-07 11:30	23.2	20	15.5	Yes	7.7	38.1	30.2	72.5	75.8	7.8	0.1	-16.1	81.8	0.63
R03	2016-01-08 18:45	28.3	19.5	16.5	Yes	11.8	40	35.9	77.7	74.6	4.5	-0.2	-11.5	90.4	0.44
R01	2016-01-09 19:30	39	20	15.5	Yes	23.5	48.9	41.7	88.4	79.3	6.4	-0.2	-14.6	89.7	0.51
R05	2016-01-10 20:30	30.6	20.5	15.5	Yes	15.1	44.1	35.5	80	71.6	5.7	-0.2	-18.2	86.5	0.33
N/A	2016-01-14 17:00	25.4	17	15.5	Yes	9.9	36.5	33.6	74.7	68.1	6.6	0.1	-8.1	94.5	n/a
Test	2016-02-13 14:00	22.3	25.5	16	No	6.3	41.9	28.3	43.5	40.2	14.5	0.1			
R04	2016-02-15 17:00	25.5	19	15.5	Yes	10	48.5	33.9	74.9	68.1	6.3	0.3	-7.8	89	1.12
R03	2016-02-17 10:00	23.9	19	15	Yes	8.9	40.3	30.2	73.3	66.8	11.6	-2.1	-22.9	77.9	0.45
Ball diamond	2016-02-25 9:00	---	18.5	15.5	Yes		43.7	24.4	69.3	56.2	9.2	-0.2	-5.5	81.4	1.27
Campground	2016-02-26 9:35	21.4	21.5	16	No	5.4	43.9	26	68.9	57	9.3	0.2			
R01	2016-02-28 10:40	22.4	20.5	16.5	Yes	5.9	55.1	26.1	71.8	65	15.6	-0.5	-2.8	85	0.92
R04	2016-03-12 17:30	37.5	25	15.5	Yes	22	56.9	44.4	86.8	82	3.8	0.4	-5.3	62.8	1.03

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N/A	2016-03-14 10:32	44.9	24	21	Yes	23.9	49	48.2	94.2	91.6	2.9	0.1	-7.6	88.2	0.87
R05	2016-03-15 11:32	26.1	22	17	Yes	9.1	56.1	32.5	75.5	65.4	13.8	-0.1	-6.2	91.4	0.86
R03	2016-03-17 10:00	111.8	115.5	45.5	No	66.3	127.7	120.4	161.2	136.7	7.8	-0.1	-4.9	70.9	1.09
Campground	2016-03-18 11:00	27.7	30.5	18.5	No	9.2	57.5	31.3	77.1	63.7	12.9	-0.1	-7.8	72.8	1.89
N/A	2016-04-01 15:00	54.4	46	30.5	Yes	23.9	61.6	64.7	103.7	108.5	4.9	0.2	3.5	67.2	1.25
R05	2016-04-15 11:46	31.9	30	18	Yes	13.9	54.3	34.4	81.2	67.1	9.1	-0.1	3.2	63.6	1.51
R03	2016-04-16 13:00	41	34.5	17	Yes	24	60.8	43.7	90.4	75.3	12.1	----	3.7	57.2	1.56
R04	2016-04-18 15:30	28	27	17	Yes	11	56.3	36.1	77.4	72	11.9	-0.1	0.5	64.2	1.73
R02	2016-04-23 8:30	29.1	28.5	16.5	Yes	12.6	65.9	38	78.5	66.9	20.1	0.1	7.3	59.3	1.44
Campground	2016-04-24 9:05	35.2	34.5	27.5	Yes	7.7	52.4	36.9	84.5	67.9	14.3	-0.1	7.6	59.9	1.28
R01	2016-04-25 12:00	39.1	39.5	36.5	No	2.6	55.1	39.5	88.4	73.4	13.5	-0.1	5.7	57.5	1.78
R01	2016-05-15 8:40	49.3	50.5	48	No	1.3	57.5	49.7	98.7	66.3	3.3	-0.1	12.2	47.4	2.3
R02	2016-05-16 11:10	44.4	42.5	24.5	Yes	19.9	64.9	56.9	93.8	84.1	10.7	----	5.9	71.5	3.12
R03	2016-05-18 13:00	38.7	38.5	24.5	Yes	14.2	60.2	40.4	88.1	76.9	13.6	0.1	7.5	66.6	1.88
R04	2016-05-19 14:15	39.2	34	21.5	Yes	17.7	59.5	46.8	88.6	81	6.3	-0.2	10.3	56.7	1.57
Campground	2016-05-21 8:30	47.1	48.5	44.5	No	2.6	56.8	47.8	96.4	79.2	7.7	----	16.6	39.4	1.47
R05	2016-05-22 11:30	41	44	30.5	No	10.5	52.8	42.8	90.4	69.9	10.3	-0.2	9.9	66.2	1.72
R01	2016-06-13 8:40	50.9	51	50	No	0.9	53.8	54.5	100.2	85.4	2.5	----	11.1	78	1.63
R05	2016-06-19 8:40	39.7	42.5	31.5	No	8.2	53	41.6	89.1	70.4	7.5	0.1	19.6	26.9	2.28
R04	2016-06-20 13:40	38.5	34	21	Yes	17.5	55.6	48.8	87.9	82.7	10	0.1	10.3	79.6	1.47
R03	2016-06-29 13:00	48	44	22.5	Yes	25.5	61	53.6	97.3	91.1	10.8	-0.2	15.5	67.8	1.35
Campground	2016-06-30 18:00	51.1	51	15.5	Yes	35.6	57	60.1	100.5	95.4	5	0.1	12.7	83.3	0.69
R05	2016-07-17 8:30	40.5	42	30.5	No	10	52.9	43.3	89.9	75.8	8.9	----	14.8	64.6	2.5
Campground	2016-07-18 14:30	48.3	46.5	44.5	Yes	3.8	54.1	56.6	97.6	90.1	4.7	-0.1	11.2	82.5	1.61
R03	2016-07-30 19:30	40.3	38.5	27	Yes	13.3	61.1	46.4	89.7	84.8	14	----	13.7	69	2
R01	2016-07-31 20:00	91	92.5	61.5	No	29.5	105.5	97.9	140.3	128.2	5.4	0.2	12.5	65.7	1.93
N/A	2016-08-18 16:35	94.1	71	35	Yes	59.1	109.9	101.7	143.5	132.6	7.9	-0.2	9.6	87	0.84
N/A	2016-08-20 13:00	38.1	40	29	No	9.1	52.3	40.5	87.4	75.3	10.4	0.1	10.6	72.3	1.55
Campground	2016-09-21 17:05	44.3	46	40.5	No	3.8	59.3	47.9	93.7	77.5	5.1	----	10.1	36.8	2.63
R01	2016-09-22 17:51	46.5	47	45	No	1.5	64.8	46.9	95.8	72.8	5.2	0.1	7.2	56.4	2.47
R04	2016-09-23 20:15	33.9	33.5	23.5	Yes	10.4	57.2	38.1	83.3	72	13.8	-0.1	4.1	59.1	1.85
R05	2016-09-24 20:40	77.2	73.5	39.5	Yes	37.7	89.3	89.8	126.6	122.1	4.5	0.2	0.9	94.4	0.88
N/A	2016-09-28 15:30	37	31	22.5	Yes	14.5	58.5	39.8	86.3	77.2	13.7	----	1	66.7	1.9
N/A	2016-10-09 9:30	42.2	43	41	No	1.2	49.5	42.8	88.4	72.6	5.3	-0.2			
N/A	2016-10-21 12:45	35.2	22	19	Yes	16.2	47.5	47.2	83.9	91.5	11.4	1.3			
N/A	2016-10-22 9:25	42	39.5	38	Yes	4	54.2	48.2	90.5	91.7	11.1	-1.1			
N/A	2016-10-23 10:28	38.7	39	38	No	0.7	45.6	40.9	87.2	82.1	3.2	-0.1			
N/A	2016-10-25 10:00	36	35.5	26	Yes	10	63.4	40.8	85.3	81	22.3	-0.1	-15.2	89	0.54
N/A	2016-10-26 11:00	33.2	34.5	25	No	8.2	59.3	35.6	82.6	70.6	22.2	-0.1	-10.7	92.1	0.66
NA	2016-10-28 9:00	35.2	37	28	No	7.2	60.3	37.9	78.6	67.8	21.4	-0.1			

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NA	2016-10-31 14:00	31.4	34	21.5	No	9.9	60.1	33.8	79.9	65.9	23.3	-0.1			
Campground	2016-11-09 7:30	34.2	34	32.5	Yes	1.7	56.4	39.5	69.2	68	6.3	0.1			
R05	2016-11-10 8:35	45.6	48.5	31	No	14.6	72.7	53.3	94.7	85.5	13.4	----			
R01	2016-11-11 7:15	40.4	40.5	37.5	No	2.9	53.6	42.4	89.8	83.4	7.1	----	1.3	69.8	1.9
	2017-06-22 13:15	42	31.5	21.5	Yes	20.5	55.6	49.9	91.4	52.7	10.7	-0.2	13.3	61.6	1.41
	2017-06-27 9:05	42.2	41	28.5	Yes	13.7	50.8	50.6	91.6	49	6.8	-0.1	12.6	65.2	1.89
	2017-06-28 13:50	46.5	44.5	42	Yes	4.5	52.6	54.7	95.9	51.6	5.1	0.1	13.2	67.1	1.6
	2017-07-23 11:30	43.7	41	25	Yes	18.7	61.7	47.5	93.1	56.2	12.5	-0.1	17	56.1	2.12
	2017-07-24 12:30	36.4	36.5	22	No	14.4	64	40.3	85.8	50.7	14.3	-3.3	17	57	2
	2017-11-17 9:00	41.5					53	43	90.9	46.9	5.3	----	-21.5	82.8	0.34
	2017-11-22 9:00	37					46.8	38.6	86.3	37.9	0.9	----	-28.8	75.8	0.14
	2018-03-29 8:30	35.2	31.5	21.5	Yes	13.7	65	42.6	84.5	54.1	18.9	0	-11.8	42	1.53
	2018-03-30 13:30	39.4	39.5	20.5	Yes	18.9	68	44.7	88.8	56.5	17.1	0.1	-11	42	1.78
	2018-04-03 13:20	44.7	47.5	19.5	Yes	25.2	75.4	48.4	91.9	35.2	20.5	0.1	-12	46	2.38
	2018-04-05 15:20	47.6	49.5	18.5	Yes	29.1	78.3	51.8	89.1	68.1	20.5	-0.3	-13.6	49.5	1.49
R05	2018-06-14 20:43	42.4					38.6	28.9	71.5	37.4	11.4	-5.7	10.4	53	1.74
R02	2018-06-19 17:49	26.8					40.9	26.9	69.2	34.7	10.5	-5.7	17.4	45.1	2.11
R05	2018-06-21 0:54	34.5					50.6	51.3	84	49.4	10.1	-5.7	16.9	55.8	1.47
R01	2018-06-26 16:35	39.2					51.3	38	79.5	50	15.5	0	11.3	71.8	1.38
R05	2018-07-19 0:18	24.2					43.4	31.4	72.1	40.6	13.8	-3.1	11.6	64.2	1.3
Campground	2018-07-24 19:55	26					73.5	49	85.9	66.1	23.7	0.1	17.3	52.9	1.17
R04	2018-08-29 12:45	37.1	32.5	23.5	Yes	13.6	62.3	41.1	86.4	50.5	13.4	0.1	8.3	75.5	1.4
R01	2018-08-30 13:45	53.1	53.5	52.5	No	0.6	57.4	54.6	102.4	55.9	12.8	-0.1	6.7	74.7	1.46
R03	2018-08-31 15:15	47.4	46	29.5	Yes	17.9	65.9	55.2	96.8	60	12.6	-0.1	4.1	90.7	0.98
Campground	2018-09-05 12:35	48.4	47.5	47	No	1.4	56.8	53.3	97.8	54.2	5.8	-0.1	7.1	73	1.37
R03	2018-09-06 12:55	42.2	42	25.5	Yes	16.7	65.5	52.2	94.5	56.6	11.4	0	5	89.4	0.6
R01	2018-09-07 18:20	46.8	47	45	No	1.8	62.7	47.6	96.2	55.1	8.3	0	4.7	85.5	1.07
R02	2018-09-09 7:50	31	30.5	20.5	Yes	10.5	59.1	36.3	80.4	49.2	18.2	-0.1	4.7	65.2	2.25
R05	2018-09-10 8:10	35.7	36.5	24.5	Yes	11.2	63.1	38.5	85.1	50	14.3	0.2	5.6	57.2	1.2
	2018-10-02 17:41	35.6	41.5	19	Yes	16.6	56.5	38.1	77	47.1	11.5	0	1.4	43.8	1.57
	2018-10-05 18:55	39.5	33.5	20	Yes	19.5	64.8	43.4	88.9	52	12.5	0	-2.7	56.5	1.15
R03	2018-10-07 8:00	45.9	40.5	21	Yes	24.9	64.7	53.1	95.3	63.3	17.4	-0.2	-3.5	53.8	2.26
Campground	2018-10-08 8:27	127.8	129.5	124	No	3.8	131.1	128.5	177.1	129.3	1.5	0.3	-7.2	65.2	1.29
	2018-10-10 10:00	45	30	17.5	Yes	27.5	58	46	94.3	54.9	9.9	0.3	-3.4	70.5	1.09
	2018-10-24 10:00	38.8	32	24.5	Yes	14.3	52.3	41.1	88.1	48	9.2	-0.5	3.3	79.2	1.89
	2018-10-25 10:35	39.1	40	21.5	Yes	17.6	68.3	44.3	88.5	54.7	15.6	0	4.6	57.8	2.92
	2018-11-18 17:35	35.9	23	19	Yes	16.9	50.6	41.3	85.3	47.1	11.2	-0.2	-16.5	87.6	0.4
	2018-11-19 18:20	25.7	21.5	18	Yes	7.7	51.8	29.8	75.1	41.5	15.8	-0.1	-11.6	91.6	0.36
	2018-11-21 8:34	40.7	19	17	Yes	23.7	55.3	43.1	90	54.1	13.4	0.6	0.1	96.3	0.44
	2018-11-28 13:05	27.6	23.5	18.5	Yes	9.1	42.5	29.2	76.9	40.5	12.9	-0.4	0.7	82	1.78

ATTACHMENT B:
KENO NOISE MONITORING DATA DECEMBER 2014 TO DECEMBER 2020

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF 10	LAeq - LAF 90% (dB)	Lzeq (dB)	LAeq (dB)	LAE (dB)	LCeq (dB)	LCeq-LAeq (dB)	Calibration Drift (dB)	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
	2018-11-30 13:05	38.8	37	37	Yes	1.8	52.6	39.6	88.2	49.2	10.4	-0.3	-4.1	96.9	0.29
	2018-12-11 7:01	41.3	40	19.5	Yes	21.8	69.9	47	90.6	56.7	15.4	-0.4	-3.6	84.1	1.43
	2018-12-12 9:01	37.6	37.5	37	Yes	0.6	54.7	37.9	86.9	42.3	4.7	0.2	-3.1	81.9	1.9
	2018-12-13 9:24	39.4	38	38	Yes	1.4	52.4	42.7	79.4	40.4	1	0.2			
	2018-12-27 13:50	7.5	8	7.5	No	0	12.7	7.7	50.6	6.6	-0.9	0.2			
	2018-12-29 14:50	20	21.5	17.5	No	2.5	37.7	20.9	61.6	30.9	10.9	-0.3			
Campground	2019-01-25 15:20	22.5	22	17	Yes	5.5	44.6	28	71.9	37.9	15.4	-0.3	-10.1	92.8	0
Campground	2019-02-23 15:25	20.5	19	17	Yes	3.5	37.2	23.7	69.8	31.1	10.6	0.1	-21.5	77.9	0.95
Campground	2019-05-10 14:30	48.5	44.5	42	Yes	6.5	63.9	58.8	97.8	53.7	5.2	0	9.7	34.5	2.51
Campground	2019-07-11 14:20	53.5	40	37	Yes	16.5	67.9	62.3	102.9	65.9	12.4	-0.1	13.6	77.2	1.23
Campground	2019-10-31 11:30	34.4	35	32.5	No	1.9	42.2	36.9	83.8	38.4	4	-0.4	-4.6	95.9	0.93
Campground	2019-11-14 13:15	21	23	17	No	4	41.8	24.8	70.4	32.6	11.6	0.2	-17.3	84.4	0.9
R01	2019-01-29 13:00	40.6	41	40	No	0.6	50.1	40.8	84.2	39.6	-1	-0.2	-16.4	87.8	0.41
R01	2019-02-24 16:35	43.2	43.5	42	No	1.2	51.5	43.2	92.5	41.5	-1.7	0.1	-18.4	77.8	0.75
R01	2019-04-25 12:30	41.8	40.5	18.5	Yes	23.3	59.6	43.6	91.1	58.6	16.8	0.2	-3.4	63.4	1.63
R01	2019-05-01 11:30	34.8	38	21	No	13.8	55.9	38.8	84.2	48.1	13.3	0.1	5.2	33.9	2.95
R01	2019-07-16 14:45	37.7	38.5	26.5	No	11.2	52.6	39.8	87	50.3	12.6	-0.1	14.8	64.7	1.54
R01	2019-09-24 13:40	38.3	39	26.5	No	11.8	50.5	39.7	87.7	49.4	11.1	-0.1	2.3	71.9	1.3
R01	2019-10-23 13:50	49.8	40	39	Yes	10.8	53.9	51.1	99.1	51.1	1.3	-0.1	-5.5	91.5	1.02
R02	2019-08-28 14:40	45.5	44	43	Yes	2.5	60.3	47.2	91.1	52.9	7.4	0	8.4	61	1.56
R02	2019-09-27 13:30	45.8	45.5	44.5	Yes	1.3	61.1	46.7	84.8	51	5.2	0.4	-1.2	64.2	1.42
R03	2019-03-05 13:20	41.3	44	17.5	No	23.8	52.2	42.2	89	45	3.7	-0.9	-16.2	65	0.92
R03	2019-03-07 13:20	37.5	41.5	17	No	20.5	53.1	38.6	75.1	44.6	7.1	-0.9	-14.9	57.5	0.92
R03	2019-02-22 13:25	40.3	31	17.5	Yes	22.8	55.6	41.6	82.2	53.7	13.4	-0.4	-19.3	73.1	1.33
R03	2019-03-07 16:51	28.3	21	17	Yes	11.3	48.8	30.4	70.6	45.4	17.1	0.2	-14.7	61.6	1.2
R03	2019-04-20 10:30	45.1	39.5	21.5	Yes	23.6	65.3	48.4	94.5	58.8	13.7	-0.1	0.4	56.1	1.84
R03	2019-05-23 13:30	56.4	45.5	27	Yes	29.4	83.2	68.8	105.7	74.6	18.2	0	14	44.2	1.57
R03	2019-08-27 14:20	39.1	39	23.5	Yes	15.6	60.7	42.6	84.8	53.6	14.5	-0.1	8.1	61.7	1.89
R03	2019-09-19 14:05	43.4	45.5	24.5	No	18.9	67.9	51.8	92.7	62.4	19	0.1	5.4	93.5	1.03
R03	2019-10-25 15:55	24.3	22.5	19	Yes	5.3	42.6	32.6	71.8	38.9	14.6	0.1	-5	91.2	0.98
R03	2019-11-20 12:10	40.6	23.5	17.5	Yes	23.1	47.3	43.6	89.9	44.3	3.7	0.1	-6	95.5	0.8
R03	2019-12-17 12:30	42.4	45	17.5	No	24.9	50.6	42.4	91.7	42.2	-0.2	-0.3	-21.4	83.3	0.21
R04	2019-01-31 16:30	39.4	40	39	No	0.4	50	39.5	76.4	39.9	0.5	1	-14.2	86.1	1.62
R04	2019-02-26 13:35	31.4	21	17.5	Yes	13.9	41.6	34.7	80.7	38.5	7.1	-0.2	-14.4	78.2	0.6
R04	2019-04-16 18:22	27	30	20.5	No	6.5	52.3	31.3	63.3	44.7	17.7	0.1	0	69.5	1.11
R04	2019-04-19 9:45	39.2	35.5	21.5	Yes	17.7	61.8	42.6	88.5	55.7	16.5	-0.4	2.2	60.1	2.27
R04	2019-05-09 11:15	33.6	34	20.5	No	13.1	67.4	35.7	82.9	52.5	18.9	0.1	8.4	50.1	2.35
R04	2019-06-26 13:15	38.3	33.5	21.5	Yes	16.8	58.1	42.9	87.6	46.4	8.1	0.2	15.2	49.4	1.96
R04	2019-07-04 13:25	39.4	32.5	20.5	Yes	18.9	53.9	47.1	88.7	43	3.6	0.1	15.7	67.6	1.42
R04	2019-08-23 13:50	39.2	33	22.5	Yes	16.7	55	43	83.5	46.4	7.2	0.1	8.5	61	1.22

ATTACHMENT B:
KENO NOISE MONITORING DATA DECEMBER 2014 TO DECEMBER 2020

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF 10	LAeq - LAF 90% (dB)	Lzeq (dB)	LAeq (dB)	LAE (dB)	LCeq (dB)	LCeq-LAeq (dB)	Calibration Drift (dB)	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
R04	2019-09-18 11:35	59.8	58.5	22.5	Yes	37.3	69.7	72.4	109.1	63.1	3.3	-0.3	5.1	86	1.53
R04	2019-10-17 13:00	29.6	28.5	20.5	Yes	9.1	46.8	35.4	79	40.4	10.8	-0.3	-3.2	88.3	0.77
R04	2019-11-15 11:50	43.4	45	18.5	No	24.9	50.9	44.5	92.8	42.5	-0.9	0.1	-21.2	80.8	0.69
R04	2019-12-13 17:18	64.5	66	59	No	5.5	67	71.5	85.3	66	1.5	0.3	-11.1	89.6	0.35
R05	2019-01-23 11:20	19.8	19.5	17	Yes	2.8	37.7	22.9	69.2	29.1	9.3	-0.2	-23.93	80.8	0
R05	2019-02-21 8:45	24.3	27	17	No	7.3	47.4	26	73.1	32.6	8.3	-0.4	-16.9	82	1.66
R05	2019-04-15 17:30	115	117.5	110	No	5	124.2	117.6	164.4	120.2	5.2	-0.3	-0.6	66.6	1.37
R05	2019-05-07 10:55	33	35	19	No	14	54.7	35.3	82.4	43.6	10.6	0.1	8.3	53.5	1.82
R05	2019-06-27 13:15	35.5	39	23.5	No	12	50.3	36.3	81.1	40.9	5.4	-0.2	15.4	29.8	1.64
R05	2019-08-22 13:20	35.4	39	19.5	No	15.9	49.2	37	79	42.7	7.3	0	4.8	66	1.2
R05	2019-10-22 13:15	23.7	26	19	No	4.7	43.8	26.5	73.1	30.7	7	0.1	-3.1	90.4	0.93
Campground	2020-01-30 13:05	19.4	18.5	17	Yes	2.4	45.2	23.8	68.7	27.8	8.4	-0.2	-12	90.3	0.74
R01	2020-02-21 14:00	19.3	20	17	No	2.3	45.3	21.5	66.7	32.9	13.6	0.1	-3.4	59.2	0.33
R01	2020-03-31 14:20	44.2	47.5	17.5	No	26.7	56.2	44.2	93.5	43.7	-0.5	0	-12.5	31.6	2.27
R01	2020-06-25 13:15	53.3	54	52.5	No	0.8	64	53.8	102.7	56.8	3.5	-0.1	10.4	72.7	1.27
R02	Station was not monitored in 2020.														
R03	2020-02-20 12:10	44.2	48	18	No	26.2	77.8	46	93.6	65.3	21.1	0.1	-5.8	63.7	2.44
R03	2020-03-12 14:00	43.4	45.5	18	Yes	25.4	52.7	43.9	92.7	46	2.6	-0.2	-21.2	57.1	0.99
R03	2020-05-06 14:55	40.9	34.5	20	Yes	20.9	56.2	47.6	90.3	50.4	9.5	0	10	32.4	2.27
R03	2020-06-23 8:00	53.2	54	33	No	20.2	60.6	65.5	102.6	56.8	3.6	-0.2	5.7	94.3	1.76
R04	2020-01-31 14:05	47.7	46	45.5	Yes	2.2	58.8	50	97	51.8	4.1	0.4	-13	89.6	0.54
R04	2020-02-18 14:10	110.7	114	103	No	7.7	123.4	116.2	160.1	116.2	5.5	-0.4	-21.3	80.3	0.52
R04	2020-03-09 13:35	34.6	31	19.5	Yes	15.1	62.8	41	83.9	47.8	13.2	0.2	-10.5	83.3	1.01
R04	2020-05-07 16:05	31.8	33	23.5	Yes	8.3	55	36.3	76	41.5	9.7	-0.1	10.4	35.4	0.97
R04	2020-06-30 13:15	44.4	42.5	30	Yes	14.4	51.9	53.5	93.7	50.3	5.9	0.1	11.7	72	2.48
R05	2020-01-23 1:55	19.4	20	17.5	No	1.9	47.5	23.3	59.5	27.9	8.5	0.1	-11.9	90.4	0.04
R05	2020-02-26 13:00	33.8	19.5	17	Yes	16.8	44.3	41.3	83.1	41.5	7.7	-0.3	-18.6	83.5	1.2
R05	2020-03-26 14:50	44.4	47.5	21	No	23.4	74.6	44.9	93.8	59.7	15.3	0.3	-5	67.6	3.03
R05	2020-05-22 12:45	41.8	36.5	28.5	Yes	13.3	60.1	46.5	80.1	52.2	10.4	0	16.8	21.7	2.05
R05	2020-06-24 12:10	51.1	43.5	27	Yes	24.1	55.9	63.2	100.5	53.3	2.2	0.1	7.2	91.8	1.38
Unknown	2020-02-07 14:20	29.9	20.5	17.5	Yes	12.4	42.5	32.3	79.3	39.5	9.6	0	-10.8	90.7	0.33
Unknown	2020-02-27 13:50	118.3	119	117	No	1.3	125	118.4	167.6	116.9	-1.4	0.4	-16.1	81.9	2.51
Unknown	2020-03-25 14:30	31	27.5	18	Yes	13	49.1	37.9	80.4	38.8	7.8	-0.4	-0.7	81.3	2.65
Unknown	2020-04-02 13:00	18.9	18.5	17.5	Yes	1.4	54.2	23.6	58.4	34.7	15.8	0.3	-7.3	37.1	1.7
Unknown	2020-04-10 0:15	35.2	28	18	Yes	17.2	62.6	41.6	84.5	46	10.8	-0.1	-4.4	34.4	2.15
Unknown	2020-04-16 14:20	35.8	36.5	17.5	No	18.3	63.7	40.6	85.2	49.2	13.4	0.2	8.4	59.1	2.31
Unknown	2020-04-28 2:02	22.3	23.5	18	Yes	4.3	52.1	24.7	71.6	38.1	15.8	-0.3	4.8	44.5	2.55
Unknown	2020-07-16 14:45	52.4	38	25.5	Yes	26.9	57.5	63.5	101.7	55.2	2.8	-0.1	18.7	43.6	1.87
Unknown	2020-07-22 12:55	56.1	53	51	Yes	5.1	59.3	65.4	105.4	58.5	2.4	0.1	11	86.5	2.03
Unknown	2020-07-23 14:45	51.4	42	26	Yes	25.4	61.9	54.9	100.8	60	8.6	-0.1	12.8	55.7	1.66

ATTACHMENT B:
KENO NOISE MONITORING DATA DECEMBER 2014 TO DECEMBER 2020

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF 10	LAeq - LAF 90% (dB)	Lzeq (dB)	LAleq (dB)	LAE (dB)	LCeq (dB)	LCeq-LAeq (dB)	Calibration Drift (dB)	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
Unknown	2020-07-30 15:00	42.8	45	35.5	No	7.3	51.7	43.4	92.1	47.4	4.6	0.2	21.5	50	1.97
Unknown	2020-08-04 13:45	48.6	37	23.5	Yes	25.1	52.1	58.6	98	50.7	2.1	0.1	15.1	64	2.39
Unknown	2020-08-23 9:15	46.9	48	25	No	21.9	61.8	55.8	96.3	60.1	13.2	-0.2	11.5	82.2	0.17
Unknown	2020-08-24 10:20	54.8	49.5	24	Yes	30.8	59	68.8	104.2	58.5	3.7	0.2	10.3	87.2	0.67
Unknown	2020-08-25 10:45	58.8	58	27	Yes	31.8	64.5	71.1	108.1	63.7	4.9	-0.5	11.7	89.2	0.91
Unknown	2020-12-07 11:45	50.8	51	50.5	No	0.3	57.1	51.4	100.1	52.9	2.1	-0.3	-3.8	97.2	0.71
Unknown	2020-12-09 14:50	83.5	52	49	Yes	34.5	89.8	84.6	132.7	86.7	3.2	0.1			
Unknown	2020-12-17 8:35	51.9	53	50	No	1.9	71.2	53.6	101.3	67.6	15.7	0.4			
Unknown	2020-12-18 9:10	66.3	51.5	49	Yes	17.3	75.4	67	115.7	74	7.7	-0.6			
Unknown	2020-12-20 2:48	54.5	56.5	51.5	No	3	69.7	56.3	103.9	66.2	11.7	-0.1			

*Unknown is a station location not recorded

** Flame & Moth Meteorological Station values was used

Legend:	
Yes	When LAeq > LAF10
<5	LAeq - LAF90 (dB) less than 5
>10	LAeq - LAF90 (dB) greater than 10
Red	Calibration Drift greater than 3.0 dB

APPENDIX C

2021 DUST MONITORING RESULTS

Memorandum

To: Arlene Stearman, Alexco Keno Hill Mining Corp.

From: Emilie Bouchard, Ensero Solutions Canada, Inc.

CC: Kai Woloshyn, Ensero Solutions Canada, Inc.

Date: March 30, 2022

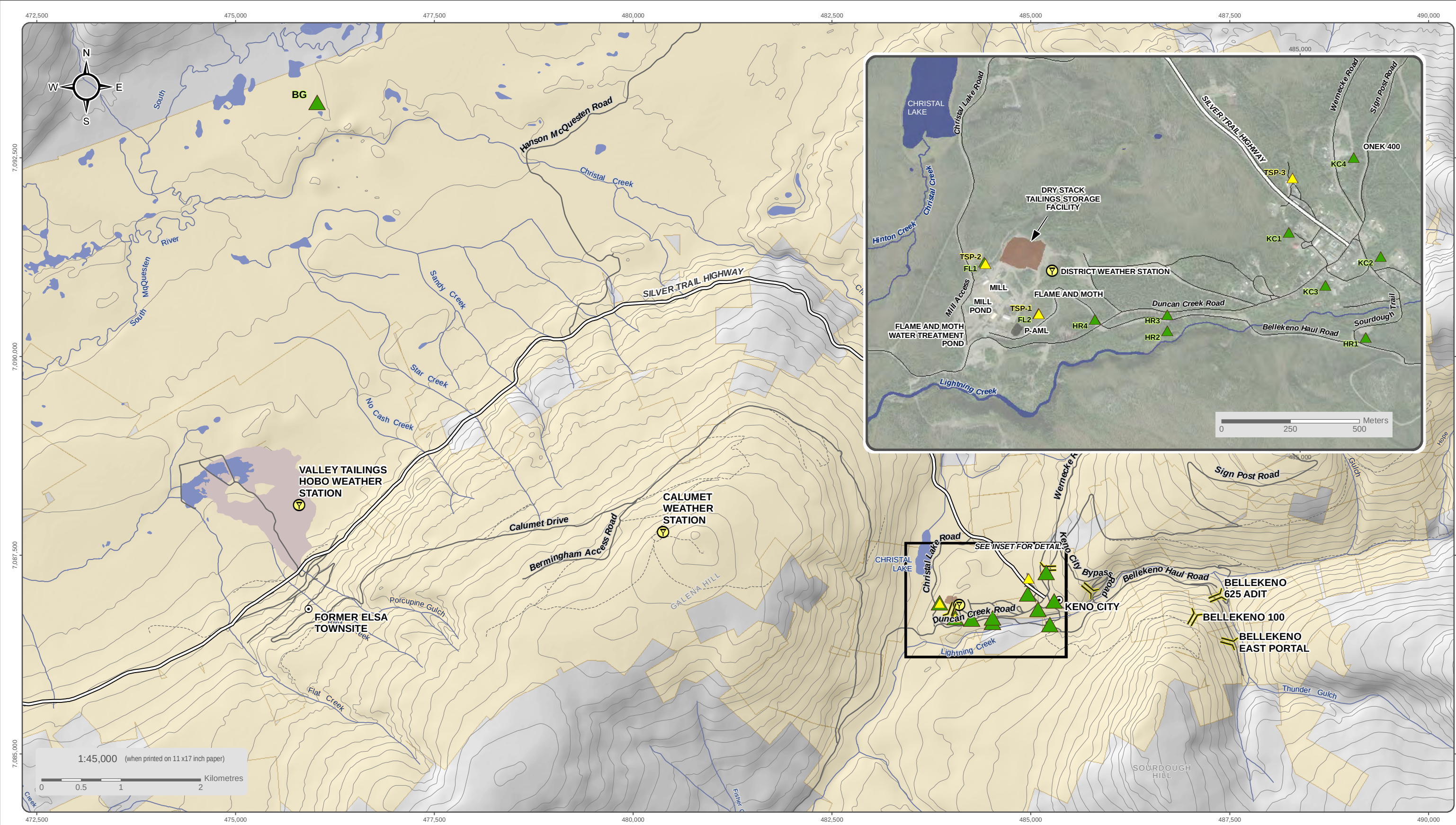
Re: Air Quality Monitoring Summary 2021, Keno, YT

Attachments: A1 to A5 – Results and Meteorological Data (2012-2021)
B – Statistical Tests Results

1 INTRODUCTION

Alexco Keno Hill Mining Corp. (AKHM) submitted a Dust Abatement and Monitoring Plan (AKHM, 2021) to the Yukon Government to fulfill conditions set out in Schedule B of Quartz Mining License QML-0009 (issued November 27, 2019). The air quality monitoring program was established in 2009, in accordance with recommendations (clause 68 to 70) stated in the Decision Document for the assessment of the Bellekeno Mine Project (YESAB File Number 2009-0030). Air quality was monitored using dustfall monitoring stations installed at four locations near the Keno District Mill site (2011). The monitoring program was amended in 2012 in accordance with the Decision Document (clauses 36 to 37) for the assessment of the Onek and Lucky Queen Deposit production (YESAB File Number 2011-0315). The amended program included measurement of total particulates per volume of air for select size fractions (total suspended particulates [TSP]). Additional sampling for coarse (PM₁₀) and fine (PM_{2.5}) fractions of particulate matter began in August 2015, following the revised Dust Abatement and Monitoring Plan required in the Decision Document (clause 19) for the assessment of the Flame & Moth Development and Production Program (YESAB file Number 2013-0161). Currently two air quality sampling stations are used for the project. This memorandum presents the results of the air quality monitoring program through 2021.

The goal of the monitoring program is to collect monthly samples from three locations (TSP-1, TSP-2, and TSP-3; Figure 1-1), to capture variability in air quality from various weather conditions. Potential dust sources include the DSTF, the crusher (building constructed over crusher in 2020), and unpaved access roads.



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Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/Services> on January 2021

Datum: NAD 83; Map Projection: UTM Zone 8N

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- Alexco TSP Monitoring Stations
- YG PM10 Monitoring Sites 2013
- Weather Station
- Adit

- Mine Feature Footprint
- Current DSTF
- Alexco/ERDC Quartz Claims
- Waterbody

- Watercourse
- Silver Trail Highway
- Other Road
- Limited-Use Road



ALEXCO KENO HILL MINING CORP.

FIGURE 1-1

METEOROLOGICAL AND

AIR QUALITY MONITORING STATIONS LOCATION

JANUARY 2021

D:\Project\All\Projects\Keno_Area_Mines\ALL-SITES\02-Map\04-Studies\Air_Noise_Dust\Air_Quality_Site_YTG_20190328.mxd
(Last edited by: amalekheva, 2021-01-12 09:30 AM)

2 SITE ACTIVITIES

Underground mine development activities restarted at Bermingham and Flame & Moth in Q3 of 2020. In Q4 of 2020 ore production from Bellekeno resumed and the District Mill returned to operation, including the placement of tailings at the dry stack tailings facility (DSTF). Production from Bellekeno Mine continued until October 15, 2021 and the last of the Bellekeno ore was processed in the mill the same day. Underground development at Bermingham and Flame & Moth continued throughout 2021. Further details on construction activities in 2021 are described in the following sections.

2.1 MINE INFRASTRUCTURE

In 2021, the concrete foundation for the Flame & Moth ventilation raise was prepared and propane tank placed nearby. The footprint for the non-acid generating and/or metal leaching (N-AML) waste rock storage area was expanded by removing trees and overburden.

Surface construction activities at Bermingham included the construction of the temporary ore and potentially acid generating and/or metal leaching (P-AML) waste rock storage area; completion of one of two P-AML waste rock storage facilities, completion of the Bermingham vent raise and associated primary fan and heater and installation of a nearby propane tank. The Bermingham water treatment plant was upgraded to include an ammonia treatment plant. The site was connected to the regional electrical power grid and the diesel generator removed and a smaller backup generator installed.

2.2 ROAD CONSTRUCTION

In 2021 the Bermingham Haul Road was improved to safely accommodate ore haulage trucks. Improvements included grading and construction of run-away lanes, berms and widening to allow areas for light vehicles to pull off. No major upgrades occurred on the roads to Lucky Queen, Christal Lake Road, Keno City to Bellekeno Haul Road Bypass, or the Bellekeno Haul Road in 2021. Standard maintenance occurred throughout the year.

2.3 MILL SITE CONSTRUCTION

In 2021, a second office and dry facility were commissioned along with a warehouse and yard adjacent to the District Mill. The enclosure of the secondary crusher building, and dust suppression was completed and a new building to protect regrind mills from the elements constructed.

Ditches and culverts at the mill yard continued to be maintained to facilitate channeling melt water in the spring and storm events into to sediment basins. Organics from the construction of the warehouse yard were either stockpiled or used on the DSTF.

2.4 DRY STACK TAILINGS FACILITY

In 2021, liner was laid for additional tailings placement in accordance with the phase 1 DSTF design. Maintenance of the ditches and sumps were made in preparation for winter. Additional maintenance activities were completed in response to recommendations from the annual geotechnical inspection.

2.5 FLAT CREEK (ELSA) CAMP UPGRADES

The welcome center at the Flat Creek Camp was commissioned in 2021. Other upgrades included: the replacement and relocation of the propane tank; additional fire protection; and the demolition of an abandoned structure.

3 INSTRUMENTATION AND METHODOLOGY

Two BGI Omni Ambient Air Quality Samplers (Figure 3-1) were commissioned in August 2012, one to the east of the mill and crusher (TSP-1) and one at the toe of the dry stack tailings facility (TSP-2). A third sampler (TSP-3), located in Keno City, was commissioned in December 2014, in accordance with the revised Dust Abatement and Monitoring Plan required in the Decision Document for the assessment of the Flame & Moth Development and Production Program (YESAB file Number 2013-0161). In August 2018, the plan was further revised, TSP-1 was relocated to the DSTF phase 2 expansion area to characterize ambient concentrations closer to town, and TSP-3 was relocated to the Alexco house in Keno City. The air quality samplers are equipped with three jet sizes: TSP, PM₁₀, or PM_{2.5} inlets (Figure 3-2). In 2021 TSP-1 was damaged and removed from service.

Samples are collected following Ensero's standard operating procedure (Ambient Air Quality Installation and Standard Operating Procedure; Ensero, 2021) to comply with the 24-hr, gravimetric National Air Pollution Surveillance (NAPS) reference method. If the 24-hr run is interrupted (e.g., power loss) a minimum of 75% data completeness is required for comparison to the Standard (CCME, 2011). Filters that run for more than 18 hours are retained and sent to the laboratory for analysis.

On a monthly basis a total of nine samples are collected at each site (three samples for each filter inlet size), and sent to Bureau Veritas Laboratories (formerly Maxxam Analytics) for gravimetric analysis and inductively coupled plasma mass spectrometry (ICP-MS) for the metals in the TSP jet sample only. The monthly monitoring requirements are summarized as:

- Three (3) 24-hr runs with the TSP jet installed at each site: TSP-1, TSP-2, and TSP-3;
- Three (3) 24-hr runs with the PM_{2.5} jet installed at each site: TSP-1, TSP-2, and TSP-3; and
- Three (3) 24-hr runs with the PM₁₀ jet installed at each site: TSP-1, TSP-2, and TSP-3.

Occasionally monthly requirements cannot be met due to operating conditions. The air quality sampling equipment is not designed to operate below -20°C therefore, sampling is typically reduced during winter months. In 2021, one BGI Omni Ambient Air Quality Sampler was damaged and could not be repaired. Consequently, no samples were collected from the TSP-1 location. In May, no samples were collected at TSP-2 and only three PM₁₀ samples were collected at TSP-3. From July to September no samples were collected from TSP-2 and TSP-3. In October, only four PM_{2.5} samples were collected at TSP-2. Two PM_{2.5} samples and three TSP samples were missed at TSP-3 in October. Sampling errors and missed sampling coincide with power failures or time not recorded (i.e., runs were less than 18 hours).

The dust sampling program is completed concurrently with meteorological monitoring, particularly temperature, windspeed, and wind direction. This meteorological data is key in understanding where the prevailing winds move dust. The Keno District Mill weather station records hourly wind speed and direction (height of 10 meters).



Figure 3-1: BGI Omni Ambient Air Quality Sampler



Figure 3-2: Inlet Jet Sizes: TSP (grey), PM₁₀ (blue), and PM_{2.5} (red)

3.1 QUALITY ASSURANCE/QUALITY CONTROL

Field blanks were collected at a rate of one blank per month as a quality assurance and quality control measure. Once a month, while visiting a station, a blank filter is left inside the ambient air quality sampler housing while a regular run is occurring.

Collection of blanks began in December 2015. Each month the blank is sent to Bureau Veritas Laboratories with the full month of samples to be analysed for gravimetric analysis and ICP metals mass spectrometry. To date, 79 blanks have been collected, with most results measured as less than the detection limit. Results greater than two times the reported detection limit (RDL) are shown in Table 1. Note that blank results from September 29, 2017, were removed from the database as unusually elevated values indicated potential contamination of the filter.

Blanks provide information on potential sampler and monitor contamination, as well as ambient air conditions. The 2021 blanks showed results higher than Reported Detection Limits in March and May seen in Table 3-1 in blue. In March 2019, detection limits were revised for multiple parameters, and hence blanks would report more concentrations and insights into data.

Table 3-1: 2016 to 2021 Blanks with Results Greater Than Two Times the Reported Detection Limit (RDL)

Date	Parameters
29-Sep-2016	Cr, Sr
29-Dec-2016	Cr
29-Jan-2017	Cr
25-Mar-2017	Cr
25-May-2017	Cr, Fe, Zn
27-July-2017	Cr
21-Mar-2018	Cr
30-Oct-2018	Cr, Zn
27-Dec-2018	Fe
28-Mar-2019	Ni, Zn, Ca, As, Mn, Cr
30-Apr-2019	Na, Zn, Ca, Ba, Cd, K, Cr, Cu
28-May-2019	Cr
25-Jun-2019	Ni, Zn, Ca, Cr
30-Jul-2019	Zn, Ca, Cr
30-Aug-2019	Pb, Ni, Zn, Mn, Cr
27-Sep-2019	Pb, Zn, Cd, Mn, Cr
29-Oct-2019	As, Cr, Cu, Ni, Zn
28-Nov-2019	Ca, Cr, Zn
27-Dec-2019	Ca, Cr, Zn
31-Jan-2020	Cd, Ca, Cr, Mo
28-Feb-2020	Cr, Zn

Date	Parameters
31-Mar-2020	Ca, Cr, Pb, Mn, Zn
30-Apr-2020	Cd, Ca, Cr, Ni, Zn
30-May-2020	Ca, Cr
24-Jun-2020	Ba, Ca, Cr, Fe, Pb, Mn
29-Aug-2020	Cr, Cu
25-Sep-2020	Cd, Ca, Cr, Zn
24-Nov-2020	Ca, Cr, Pb
19-Mar-2021	Ba, Ca, Cr, Pb, Mn, Ni, Zn
19-May-2021	Cd, Cr, Fe, Ni

Note: cells highlighted blue are 2021 samples where blanks were greater than two times the Reported Detection Limit.

4 RESULTS

4.1 AMBIENT TSP, PM₁₀ AND PM_{2.5} CONCENTRATIONS

Results of the gravimetric analyses are converted into 24-hr average ambient concentrations based on the flow rate of the instruments. These are compared with the Yukon Ambient Air Quality Standard (YAAQS, 2019; 24-hr average):

- 120 µg/m³ (60 µg/m³ annual average) for TSP;
- 50 µg/m³ for PM₁₀; and
- 27 µg/m³ (8.8 µg/m³ annual average) for PM_{2.5}.

4.1.1 2021 Sample Results

Summary statistics for January 2021 to December 2021 are presented in Table 4-1 below for the two sampling locations (TSP-2 and TSP-3). When results were below the detection limit, half the detection limit was used to calculate the summary statistics.

For the 2021 monitoring period, all results met standards for YAAQS, except for one fine particulate matter (PM_{2.5}) reading of 31.4 µg/m³ recorded on June 22. The greatest average TSP concentration was measured at TSP-3 (4.0 µg/m³) and the lowest average at TSP-2 (3.4 µg/m³). The difference between TSP concentrations were not statistically significant and concentrations are less than the YAAQS (120 µg/m³). Additionally, TSP average annual concentrations (TSP-2: 3.4 µg/m³, TSP-3: 4.0 µg/m³) are also well below the YAAQS annual average (60 µg/m³).

For coarse particulate matter (PM₁₀), the greatest average concentration was recorded at TSP-2 (7.0 µg/m³) and the lowest average at TSP-3 (4 µg/m³). PM₁₀ concentrations between stations were not significant and were below the YAAQS (50 µg/m³). For fine particulate matter (PM_{2.5}), the greatest average concentration was recorded at TSP-2 (5.7 µg/m³) and the lowest average at TSP-3 (3.7 µg/m³). PM_{2.5} concentrations between stations were not significant and were below the YAAQS (27 µg/m³) except for one TSP-2 concentration of 31.4 µg/m³ recorded on June 22. The PM_{2.5} average annual concentrations (TSP-2: 5.7 µg/m³, TSP-3: 3.7 µg/m³) are also below the YAAQS (8.8 µg/m³).

Table 4-1: Total Suspended Particulates, Coarse and Fine Particulate Matter Summary Statistics 2021 ($\mu\text{g}/\text{m}^3$)

	TSP ($\mu\text{g}/\text{m}^3$)		PM ₁₀ ($\mu\text{g}/\text{m}^3$)		PM _{2.5} ($\mu\text{g}/\text{m}^3$)	
Yukon Ambient Air Quality Standards	120		50		27	
Sampling Location	TSP-2	TSP-3	TSP-2	TSP-3	TSP-2	TSP-3
Average	3.4	4.0	7.0	4.0	5.7	3.7
Count	18	18	22	18	23	21
Minimum	2.8	2.8	2.8	2.8	2.8	2.8
Maximum	11.5	7.1	28.5	7.1	31.4	8.7
Geometric Mean	3.2	3.7	4.9	3.7	4.3	3.4
Count <DL	0	0	0	0	0	0
Standard Deviation	2.1	1.7	7.5	1.7	6.4	1.9
1st Quartile	2.8	2.8	2.8	2.8	2.8	2.8
Median	2.8	2.8	2.8	2.8	2.8	2.8
3rd Quartile	2.8	5.8	8.2	5.8	6.2	2.8
99 Percentile	10.5	7.1	28.4	7.1	27.8	8.4
Count Over Standard	0	0	0	0	1	0
% Over Standard	0	0	0	0	4.3	0

Note: bold = exceedance of YAAQS

4.1.2 Cumulative 2012-2021 Results

Summary statistics for 2012-2021 are presented in Table 4-2 for the three sampling locations (TSP-1, TSP-2, and TSP-3), and the complete results are presented in Attachment A1 and A2. When results were below the detection limit, half the detection limit was used to calculate the summary statistics.

Most results met standards for YAAQS, apart from one PM₁₀ exceedance at TSP-3 on July 23, 2020, and two PM_{2.5} exceedances at TSP-1 and TSP-2 on July 9, 2019, and June 22, 2021, respectively.

The sample collected on July 14, 2017 is considered an outlier as it was an order of magnitude higher than historic TSP-3 and TSP-1 results, and results for TSP-2 from samples collected on the same day. The air quality monitoring results on the same day for TSP-1 for PM_{2.5} was $7.9 \mu\text{g}/\text{m}^3$ and for TSP-2 PM₁₀ was $9.2 \mu\text{g}/\text{m}^3$. Both TSP-1 and TSP-2 are closer to the District Mill and DSTF area and could explain the exceedance. The TSP-3 PM_{2.5} outlier result from July 14, 2017 may be due to laboratory error or filter contamination between being provided by the lab and being analysed in the lab. No trends in the TSP, PM₁₀, and PM_{2.5} data before, on, or after this date validate this outlier result. Note that over half of the results for each of the three parameters are below the detection limit at all three stations.

The air quality monitors located on site are 160 m (TSP-1) and 46 m (TSP-2) away from the DSTF, and 163 m (TSP-1) and 240 m (TSP-2) away from the crusher, two of the main potential dust sources. The nearest residence is 710 m

from the DSTF and 860 m from the crusher. As shown in the Windrose plots for 2011-2021 and 2021 (see Section 3.3) the prevailing winds measured by the District Mill weather station come from the east. Since the DSTF and crusher are west and downwind of Keno City, this lowers the potential contribution of dust laden air to Keno City. TSP levels experienced at the nearest residence are better approximated by levels observed at air quality monitor TSP-3, located in Keno City (950 m from the DSTF and 1,240 m from the crusher). Note that the mine announced a temporary closure as of September 4, 2013, and operations were limited to water treatment, inspections, and monitoring until the commencement of underground development at Flame & Moth in May 2018. Therefore, the crusher and DSTF would not have contributed to fugitive dust emissions from September 2013 to May 2018.

Table 4-2: Total Suspended Particulates, Coarse, and Fine Particulate Matter Summary Statistics 2012–2021 ($\mu\text{g}/\text{m}^3$)

	TSP ($\mu\text{g}/\text{m}^3$)			PM ₁₀ ($\mu\text{g}/\text{m}^3$)			PM _{2.5} ($\mu\text{g}/\text{m}^3$)		
Yukon Ambient Air Quality 24 hour Standards	120			50			28		
Sampling Location	TSP-1*	TSP-2	TSP-3	TSP-1	TSP-2	TSP-3	TSP-1	TSP-2	TSP-3*
Average	5.2	6	5.1	4.7	4.8	4.5	3.9	4.3	4.2
Count	293	301	210	180	190	199	175	197	196
Minimum	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Maximum	53.2	62.2	68.1	46	38.1	65.7	28.2	31.4	21.2
Geometric Mean	4	4.4	4	3.7	3.7	3.6	3.4	3.6	3.6
Count <DL	0	0	0	0	0	0	0	0	0
Standard Deviation	5.4	6.9	6.2	5.6	5.4	5.3	3.1	3.9	2.8
1 st Quartile	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Median	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
3 rd Quartile	6.1	6.9	6.1	2.8	2.8	2.8	2.8	2.8	2.8
99 Percentile	22.3	34.9	22.6	36.3	29.2	18.7	15.9	20.9	13.6
Count Over Standard	0	0	0	0	0	1	1	1	0
% Over Standard	0	0	0	0	0	0.5	0.6	0.5	0

Note: bold = exceedance of YAAQS

* Two outliers removed (TSP-1 976.4 $\mu\text{g}/\text{m}^3$ on July 1, 2015; TSP-3 65 $\mu\text{g}/\text{m}^3$ on July 14, 2017)

The greatest average TSP concentration was measured at TSP-2 (6.0 $\mu\text{g}/\text{m}^3$) and the lowest average at TSP-3 (5.1 $\mu\text{g}/\text{m}^3$). No significant differences were detected between locations and all concentrations were less than the YAAQS. For coarse particulate matter (PM₁₀), the greatest average concentration was recorded at TSP-2 (4.8 $\mu\text{g}/\text{m}^3$) while TSP-3 had the lowest measured average (4.2 $\mu\text{g}/\text{m}^3$); however, the difference is not statistically significant, and concentrations are less than the YAAQS, except for one exceedance at TSP-3. For fine particulate matter (PM_{2.5}), the greatest average concentration was recorded at TSP-2 (4.3 $\mu\text{g}/\text{m}^3$) and the lowest average at TSP-1 (3.9 $\mu\text{g}/\text{m}^3$). No significant differences were seen between sites for PM_{2.5}; however, there were two exceedances recorded at TSP-1 and TSP-2.

Most 2021 results were approximately 1.0 $\mu\text{g}/\text{m}^3$ less than the cumulative 2012-2021 average. Average coarse particulate matter was slightly greater than the 2012-2021 average at TSP-2 and average fine particulate matter was

slightly greater than the 2012-2021 average at TSP-2. Exceedances were recorded for TSP concentration at monitoring location TSP-1 (July 1, 2015); however, this was determined to be an outlier as all other results were less than the YAAQS.

4.2 METAL SPECIATION

There are no ambient air quality standards for metals in Yukon; however, the Ontario Ministry of Environment has developed a comprehensive list of Ambient Air Quality Criteria (AAQC) that includes 24-hr average concentrations for metals (Ontario Ministry of Environment, 2012). These are referenced in the following discussion for information (context) only.

4.2.1 2021 Metal Speciation Results

Table 4-3 presents the summary statistics for January 2021 to December 2021 for metal concentrations from samples TSP-2 and TSP-3. When results were below the detection limit, a value of half the detection limit was used to calculate the statistics. All parameters in 2021 met AAQC criteria except for cadmium at TSP-3, which exceeded standards 5% of the time.

Table 4-3: Metal Concentrations Summary Statistics (24-hr) for 2021

	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	S	Sn	Ti	V	Zn	Zr	
Ontario Ambient Air Quality Criteria (µg/m³)	n/a	25	0.3	10	0.01	120	0.025	n/a	0.5	0.1	50	4	0.5	n/a	0.4	120	2	n/a	n/a	10	n/a	1	n/a	120	n/a	10	120	2	120	n/a	
TSP-2																															
Average	0.036	0.00083	0.00083	0.0020	0.00035	0.021	0.00051	0.335	0.0804	0.00035	0.003	0.119	0.04464	0.035	0.011	0.00023	0.00190	0.056	0.040	0.00035	0.204	0.00052	0.116	0.00081	69.4	0.00114	0.014	0.014	0.0504	0.003	
Count	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Minimum	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00007	0.069	0.0421	0.00035	0.001	0.021	0.00035	0.021	0.001	0.00021	0.00096	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0035	0.003	
Maximum	0.175	0.00560	0.00533	0.0085	0.00035	0.021	0.00182	0.917	0.1224	0.00035	0.010	0.642	0.20556	0.158	0.077	0.00062	0.00856	0.056	0.079	0.00035	0.736	0.00185	0.208	0.00200	69.4	0.01667	0.014	0.014	0.1958	0.003	
Geometric Mean	0.027	0.00054	0.00056	0.0014	0.00035	0.021	0.00029	0.260	0.0777	0.00035	0.002	0.089	0.01452	0.029	0.005	0.00022	0.00160	0.056	0.039	0.00035	0.171	0.00032	0.105	0.00072	69.4	0.00044	0.014	0.014	0.0351	0.003	
Count <DL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Standard Deviation	0.036	0.00118	0.00111	0.0019	0.00000	0.000	0.00055	0.204	0.0214	0.00000	0.002	0.129	0.05694	0.031	0.016	0.00009	0.00163	0.000	0.014	0.00000	0.168	0.00054	0.054	0.00041	0.0	0.00356	0.000	0.000	0.0448	0.000	
1st Quartile	0.014	0.00035	0.00035	0.0009	0.00035	0.021	7.00E-05	0.153	0.0658	0.00035	0.001	0.058	0.00342	0.021	0.002	0.00021	0.00111	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0208	0.003	
Median	0.029	0.00035	0.00035	0.0012	0.00035	0.021	0.00029	0.361	0.0736	0.00035	0.002	0.078	0.02028	0.021	0.006	0.00021	0.0014	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00081	69.4	0.00035	0.014	0.014	0.0424	0.003	
3rd Quartile	0.036	0.00096	0.00106	0.0025	0.00035	0.021	0.00074	0.444	0.0943	0.00035	0.003	0.137	0.06139	0.044	0.015	0.00021	0.00186	0.056	0.035	0.00035	0.139	0.00064	0.153	0.00104	69.4	0.00035	0.014	0.014	0.0568	0.003	
Count exceeding standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% exceeding standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TSP-3																															
Average	0.036	0.00088	0.00040	0.0016	0.00035	0.021	0.00851	0.309	0.0826	0.00035	0.002	0.079	0.00876	0.027	0.003	0.00022	0.00164	0.056	0.045	0.00035	0.278	0.00018	0.147	0.00082	69.4	0.00048	0.014	0.014	0.0285	0.003	
Count	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Minimum	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00007	0.069	0.0603	0.00035	0.000	0.050	0.00081	0.021	0.001	0.00021	0.00079	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0035	0.003	
Maximum	0.119	0.00803	0.00138	0.0042	0.00035	0.021	0.17361	0.528	0.1269	0.00035	0.005	0.299	0.06903	0.050	0.017	0.00049	0.00528	0.056	0.122	0.00035	1.611	0.00057	0.250	0.00192	69.4	0.00162	0.014	0.014	0.0864	0.003	
Geometric Mean	0.029	0.00047	0.00037	0.0013	0.00035	0.021	0.00027	0.250	0.0805	0.00035	0.002	0.071	0.00364	0.025	0.002	0.00022	0.00149	0.056	0.041	0.00035	0.198	0.00016	0.130	0.00074	69.4	0.00043	0.014	0.014	0.0202	0.003	
Count <DL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Standard Deviation	0.025	0.00175	0.00022	0.0011	0.00000	0.000	0.03783	0.154	0.0197	0.00000	0.001	0.054	0.01718	0.011	0.003	0.00006	0.00094	0.000	0.026	0.00000	0.343	0.00012	0.071	0.00036	0.0	0.00032	0.000	0.000	0.0239	0.000	
1st Quartile	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00015	0.153	0.0694	0.00035	0.001	0.054	0.002	0.021	0.001	0.00021	0.00125	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00071	69.4	0.00035	0.014	0.014	0.0121	0.003	
Median	0.032	0.00035	0.00035	0.0011	0.00035	0.021	0.00019	0.361	0.0749	0.00035	0.001	0.065	0.00279	0.021	0.002	0.00021	0.00147	0.056	0.035	0.00035	0.139	0.00014	0.139	0.00089	69.4	0.00035	0.014	0.014	0.0174	0.003	
3rd Quartile	0.043	0.00035	0.00035	0.0028	0.00035	0.021	0.00029	0.417	0.0972	0.00035	0.002	0.079	0.00539	0.021	0.002	0.00021	0.00167	0.056	0.035	0.00035	0.139	0.00014	0.208	0.00099	69.4	0.00035	0.014	0.014	0.04	0.003	
Count exceeding standard	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% exceeding standard	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Note: bold = exceeded standard

"n/a" was used to signify when no Ontario Ambient Air Quality Criteria (µg/m³) exists for specific metals.

4.2.2 Cumulative 2012-2021 Metal Speciation Results

Table 4-4 presents the summary statistics for 2012 to 2021 for metal concentrations from samples TSP-1, TSP-2, and TSP-3, while the complete result tables are presented in Attachment A3 to A5. When results were below the detection limit a value of half the detection limit was used to calculate the statistics.

All parameters met AAQC criteria except for cadmium (TSP-2 – 0.7% of samples; TSP-3 – 0.9% of samples), lead (TSP-1 – 0.7% of samples; TSP-2 – 0.3% of samples), and manganese (TSP-2 – 1.3% of samples).

Table 4-4: Metal Concentrations Summary Statistics (24-hour) 2012 – 2021

	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	S	Sn	Ti	V	Zn	Zr
Ontario Ambient Air Quality Criteria (µg/m³)	n/a	25	0.3	10	0.01	120	0.025	n/a	0.5	0.1	50	4	0.5	n/a	0.4	120	2	n/a	n/a	10	n/a	1	n/a	120	n/a	10	120	2	120	n/a
TSP-1*																														
Average	0.168	0.1099	0.0441	0.0025	0.0045	0.023	0.0110	0.335	0.0769	0.0275	0.028	0.183	0.0521	0.034	0.010	0.0275	0.0278	0.176	0.557	0.0278	0.375	0.0166	0.240	0.0029	14.1	0.0449	0.014	0.020	0.0345	0.028
Count	296	296	296	296	296	296	296	296	294	296	296	296	296	296	296	296	296	296	296	296	230	292	294	296	293	296	296	296	296	296
Minimum	<0.20	<0.0050	<0.0050	<0.0050	<0.0050	<0.30	<0.0010	<1.0	<0.30	<0.0050	<0.0050	<0.30	<0.0050	<0.30	<0.0050	<0.0030	<0.0050	<0.80	<0.50	<0.0050	<2.0	<0.0020	<1.0	<0.0050	<2.0	<0.0050	<0.20	<0.20	<0.050	<0.050
Maximum	5.292	0.1389	0.0556	0.0222	0.0056	0.264	0.0139	8.722	0.1458	0.0347	0.035	2.528	1.0833	0.429	0.301	0.0347	0.0347	0.208	0.694	0.0792	3.875	0.0208	2.444	0.0410	69.4	0.1931	0.042	0.021	0.8167	0.035
Geometric Mean	0.110	0.0403	0.0205	0.0021	0.0031	0.021	0.0055	0.214	0.0723	0.0133	0.019	0.106	0.0294	0.027	0.006	0.0124	0.0177	0.158	0.379	0.0133	0.257	0.0075	0.206	0.0021	0.4	0.0199	0.014	0.019	0.0206	0.021
Count <DL	238	293	287	214	296	292	255	185	15	296	238	45	235	236	206	290	235	296	289	294	181	291	235	213	270	289	295	296	184	296
Standard Deviation	0.433	0.0565	0.0223	0.0025	0.0021	0.020	0.0056	0.744	0.0240	0.0140	0.013	0.244	0.0784	0.042	0.025	0.0140	0.0136	0.062	0.266	0.0146	0.545	0.0084	0.201	0.0036	27.8	0.0252	0.002	0.003	0.0689	0.013
1st Quartile	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.0139	0.139	0.0639	0.0347	0.035	0.051	0.0556	0.021	0.006	0.0347	0.0347	0.208	0.694	0.0347	0.208	0.0208	0.208	0.0021	0.1	0.0556	0.014	0.021	0.0139	0.035
Median	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.0139	0.139	0.075	0.0347	0.035	0.09	0.0556	0.021	0.006	0.0347	0.0347	0.208	0.694	0.0347	0.208	0.0208	0.208	0.0021	0.1	0.0556	0.014	0.021	0.0139	0.035
3rd Quartile	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.0139	0.389	0.0917	0.0347	0.035	0.302	0.0556	0.021	0.006	0.0347	0.0347	0.208	0.694	0.0347	0.208	0.0208	0.208	0.0021	0.3	0.0556	0.014	0.021	0.0319	0.035
Count Over Standard	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Over Standard	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSP-2																														
Average	0.127	0.10055	0.04048	0.0025	0.00412	0.022	0.01032	0.288	0.0783	0.0252	0.026	0.231	0.05556	0.038	0.022	0.02518	0.02579	0.166	0.515	0.02519	0.35	0.01523	0.209	0.00241	18.8	0.04033	0.014	0.019	0.045	0.026
Count	303	303.0000	303.0000	303	303.0000	303.000	303.0000	303	303.0000	303	303.0000	303.0000	303	303.0000	303.000	303.0000	303	303.0000	303	303.0000	243.0000	301	303.0000	303.000	300.0000	303	303.0000	303	303.0000	303.0000
Minimum	0.014	0.0004	0.0004	0.0003	0.0004	0.021	0.0001	0.069	0.0208	0.00035	0.0000	0.0210	0.00035	0.0210	0	0.0002	0.00082	0.056	0.035	0.0004	0.1390	0.00014	0.0690	0.00035	0.1000	0.00035	0.014	0.014	0.0035	0.0030
Maximum	1.625	0.1389	0.0556	0.0476	0.0056	0.099	0.0403	3.472	0.1889	0.03472	0.0350	2.7780	0.73611	0.4680	0.651	0.0347	0.06417	0.208	0.694	0.0347	5.0280	0.02083	1.1250	0.03167	69.4000	0.05556	0.032	0.021	0.4819	0.0350
Geometric Mean	0.095	0.0284	0.0159	0.002	0.0026	0.021	0.0046	0.221	0.073	0.00975	0.0160	0.1310	0.03171	0.0300	0.008	0.0088	0.01487	0.145	0.319	0.0097	0.2380	0.00583	0.1890	0.00185	0.7000	0.01416	0.014	0.019	0.0264	0.0180
Count <DL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	0.137	0.06201	0.02441	0.0033	0.00234	0.006	0.00645	0.297	0.0262	0.0154	0.015	0.281	0.06411	0.041	0.065	0.01544	0.01489	0.068	0.29	0.01541	0.533	0.00917	0.114	0.00267	30.8	0.02465	0.001	0.003	0.0607	0.014
1st Quartile	0.112	0.0013	0.0033	0.0021	0.0004	0.021	0.0010	0.139	0.0625	0.00035	0.0050	0.0600	0.05556	0.0210	0.006	0.0005	0.0027	0.0560	0.083	0.0004	0.1390	0.00082	0.2080	0.002	0.1000	0.00035	0.0140	0.014	0.0139	0.0030
Median	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.0139	0.139	0.0775	0.03472	0.0350	0.1240	0.05556	0.0210	0.006	0.0347	0.03472	0.208	0.694	0.0347	0.2080	0.02083	0.2080	0.00208	0.1000	0.05556	0.014	0.021	0.0139	0.0350
3rd Quartile	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.0139	0.41	0.0958	0.03472	0.0350	0.3460	0.05556	0.0440	0.012	0.0347	0.03472	0.208	0.694	0.0347	0.2080	0.02083	0.2080	0.00208	69.4000	0.05556	0.014	0.021	0.0510	0.0350
Count Over Standard	0	0.0000	0.0000	0	0.0000	0	2.0000	0	0	0	0.0000	0.0000	1	0.0000	4	0.0000	0	0	0	0.0000	0.0000	0	0.0000	0	0.0000	0	0	0	0.0000	0.0000
% Over Standard	0	0	0	0	0	0	0.7	0	0	0	0	0	0.3	0	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSP-3																														
Average	0.141	0.08572	0.03442	0.0022	0.00356	0.024	0.00969	0.362	0.0764	0.02151	0.022	0.093	0.03553	0.037	0.005	0.02148	0.02196	0.15	0.446	0.02151	0.252	0.01288	0.203	0.00455	25.8	0.03444	0.014	0.018	0.0385	0.023
Count	216	216.0000	216.0000	216	216.0000	216.000	216	216.0000	216.0000	216	216.0000	216.000	216	216.0000	216.0000	216	216.0000	216.000	216	216.0000	204.0000	216	216.0000	216.000	213	216.0000	216.0000	216	216.0000	216.000
Minimum	0.014	0.0004	0.0004	0.0003	0.0004	0.021	0.00007	0.0690	0.0208	0.00035	0.0000	0.021	0.00035	0.0210	0.0000	0.00021	0.0008	0.056	0.035	0.0004	0.1390	0.00014	0.0690	0.00035	0.1	0.0004	0.0140	0.014	0.0035	0.003
Maximum	2.778	0.1389	0.0556	0.0236	0.0056	0.218	0.17361	6.4170	0.1583	0.03472	0.0350	0.514	0.06903	0.5530	0.0700	0.03472	0.0347	0.208	0.694	0.0347	1.6110	0.02083	1.4720	0.175	69.4	0.0556	0.0140	0.021	0.6472	0.035
Geometric Mean	0.083	0.0146	0.0083	0.0018	0.0019	0.022	0.00273	0.2320	0.0730	0.00593	0.0110	0.066	0.01403	0.0270	0.0040	0.00511	0.0102	0.126	0.235	0.0059	0.2120	0.00308	0.1790	0.00169	1.2	0.0086	0.0140	0.018	0.0209	0.014
Count <DL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	0.309	0.0675	0.0268	0.0025	0.0025	0.021	0.01308	0.7330	0.0222	0.01676	0.0160	0.088	0.02604	0.0610	0.0060	0.0168	0.0162	0.074	0.316	0.0168	0.2270	0.01008	0.1250	0.019	33.5	0.0268	0.0000	0.003	0.0713	0.016
1st Quartile	0.04	0.0004	0.0004	0.0014	0.0004	0.021	0.00019	0.1390	0.0635	0.00035	0.0020	0.044	0.002	0.0210	0.0020	0.00021	0.0015	0.056	0.035	0.0004	0.1390	0.00014	0.1810	0.00093	0.1	0.0004	0.0140	0.014	0.0139	0.003
Median	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.01389	0.1460	0.0763	0.03472	0.0350	0.065	0.05556	0.0210	0.0060	0.03472	0.0347	0.208	0.694	0.0347	0.2080	0.02083	0.2080	0.00208	0.1	0.0556	0.0140	0.021	0.0139	0.035
3rd Quartile	0.139	0.1389	0.0556	0.0021	0.0056	0.021	0.01389	0.4170	0.0875	0.03472	0.0350	0.097	0.05556	0.0210	0.0060	0.03472	0.0347	0.208	0.694	0.0347	0.2080	0.02083	0.2080	0.00208	69.4	0.0556	0.0140	0.021	0.0363	0.035

	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	S	Sn	Ti	V	Zn	Zr
Ontario Ambient Air Quality Criteria (µg/m³)	n/a	25	0.3	10	0.01	120	0.025	n/a	0.5	0.1	50	4	0.5	n/a	0.4	120	2	n/a	n/a	10	n/a	1	n/a	120	n/a	10	120	2	120	n/a
Count Over Standard	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Over Standard	0	0.0000	0.0000	0	0.0000	0.000	0.9	0.0000	0.0000	0	0.0000	0.000	0	0.0000	0.0000	0	0.0000	0.000	0	0.0000	0.0000	0	0.0000	0.000	0	0.0000	0.0000	0	0.0000	0.000

Note: bold = exceeded standard

* Two outliers removed (TSP-1 976.4 µg/m³ on July 1, 2015; TSP-3 65 µg/m³ on July 14, 2017)

“n/a” was used to signify when no Ontario Ambient Air Quality Criteria (µg/m³) exists for specific metals.

Half the RDL was used to calculate averages for samples that were below the RDL. As the samples were not normally distributed and variances were not equal, non-parametric tests (Kruskal-Wallis and Mann-Whitney) were used for statistical comparisons of the sample medians of 2021 data only and medians of data from all years (2012 – 2021) at a significance level (p) of 0.05 (Attachment B). The concentrations of total metals were significantly different ($p < 0.05$) for silver between TSP-2 and TSP-3 in 2021. Slight differences ($0.01 < p < 0.05$) in metal concentrations were also detected between stations for arsenic, copper, lead, and manganese. No detectable differences were found for all other analytes in 2021. Concentrations of total metals measured at TSP-1, TSP-2, and TSP-3 from 2012 to 2021 were significantly different ($p < 0.05$) for aluminum, antimony, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, phosphorous, potassium, selenium, silicon, silver, strontium, sulfur, tin, vanadium, zinc, and zirconium. Dunn's pairwise post-hoc test was used to determine between which stations (TSP-1, TSP-2, or TSP-3) analytes significantly differed. Usually, concentrations of total metals were greater at TSP-1 (located closest to mining activity) compared to TSP-3 (located furthest from mining activity). Slight differences ($0.01 < p < 0.05$) were detected for barium, magnesium, and sodium, and no detectable differences were seen for boron, chromium, and titanium.

Dust originating from the DSTF may contain arsenic, aluminum, calcium, iron, magnesium, manganese, lead, and zinc, based on metal characterization analyses of the tailings conducted from 2012 to 2013. From the wind direction distribution, TSP-2 is more frequently located downwind of the DSTF than TSP-1 and may record concentrations of the previously listed metals. The current average concentrations of these parameters remain below recommended standards (Ontario AAQC).

When TSP levels were above average and exceeded Ontario AAQCs (lead at TSP-1), winds were generally blowing from the northeast and from the east (October 23, 2012, and June 18, 2013). Site activities occurring in October 2012 and June 2013 included active mining at Bellekeno, development at Lucky Queen and Onek, milling at the Keno District Mill, and explorations activities at Flame & Moth. Unpaved roads may have contributed ambient dust on these occasions. Roads near TSP stations include mine and public roads (including Duncan Creek Road).

When metal concentrations exceeded the Ontario AAQCs (cadmium, lead, and manganese) at TSP-2, winds were generally blowing from the north-northeast (August 23, 2012). Dust from unpaved roads could have triggered these events. On days where TSP levels were higher than average and/or where exceedances of the Ontario AAQCs were observed for manganese at TSP-2, winds were generally blowing from the northeast (March 23-24, 2013, and August 9, 2017) and from the east (April 7, 2013). On these occasions, the DSTF could have been a source of TSP at TSP-2. Similarly, on days where exceedances of the Ontario AAQCs were observed for cadmium at TSP-2 (September 28, 2013, and October 21, 2015), winds were generally from the northeast or north-northeast suggesting possible contributions of dust from the DSTF and/or from unpaved roads. Site activities occurring in August 2012, March 2013, and April 2013 included mining at Bellekeno, development at Lucky Queen (LQ) and Onek, and milling at the Keno District Mill. Between September 2013 and December 2018, only care and maintenance activities took place (mining and milling activities were superseded) with exception of collaring Flame and Moth Portal in 2016 and the preparation of the Flame and Moth Pond. Detailed meteorological conditions and site activities associated with each ambient air quality sampling event are provided with the complete tabular data in Attachment A1.

4.3 WIND ANALYSIS

Hourly wind speed and direction was recorded between November 2011 and December 2021, at the Keno District Mill weather station (Attachment A1). The wind rose plot shown in Figure 4-1 depicts this information based on 36 wind direction categories. The average wind speed is 1.21 m/s and winds are calm 24% of the time. Note that the wind sensor experienced occasional icing during the winter months and extended periods of zero wind speed were excluded from this analysis. Also, winter wind speeds may occasionally be underestimated due to the presence of ice on the sensor, but these occurrences cannot be detected in the data record. Wind speed and direction frequency distribution are compiled in Table 4-5 below, and are based on eight wind direction categories, and six wind speed categories.

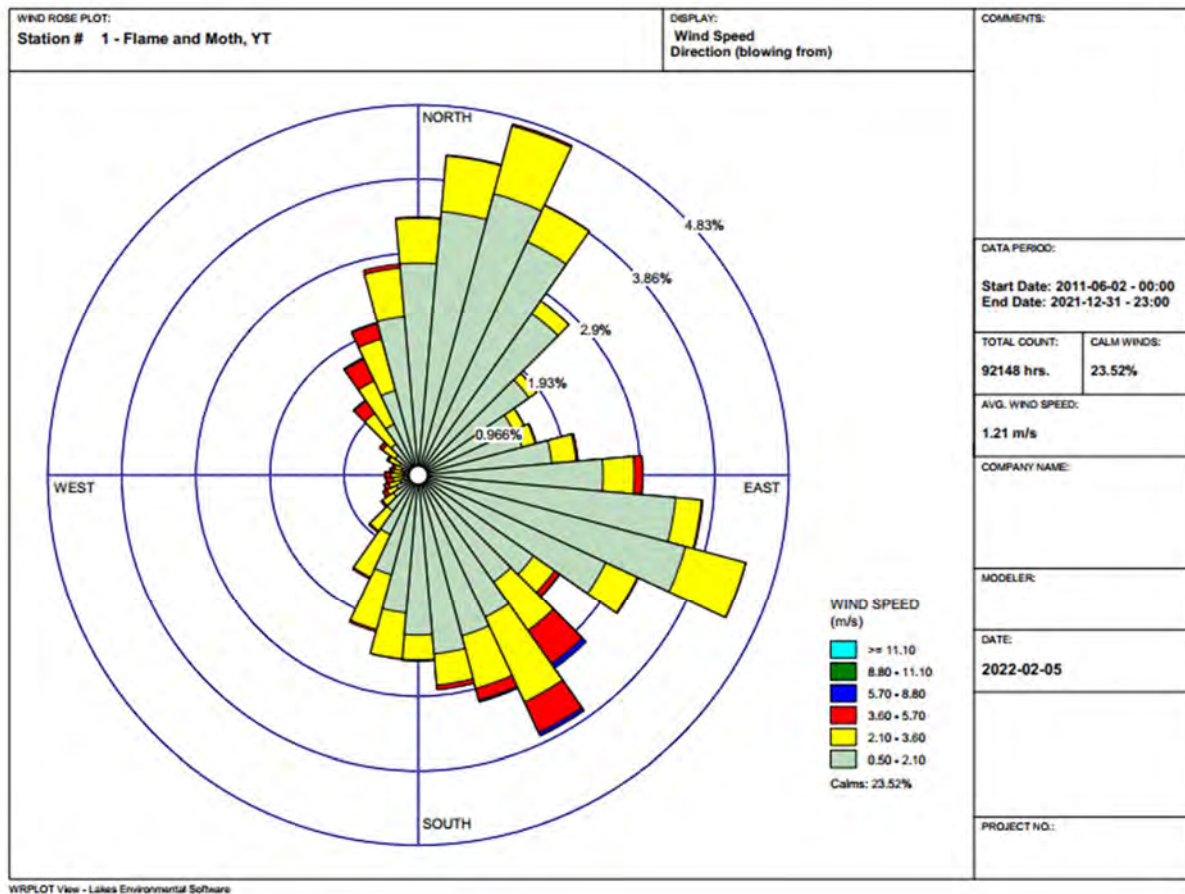


Figure 4-1: Wind Rose (direction blowing from), Keno District Mill Weather Station, June 2011 – December 2021

Table 4-5: Wind Frequency Distribution Keno District Mill, November 2011 – December 2021

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total (%)
N	12.19	3.19	0.25	0.01	0.00	0.00	15.64
NE	10.17	1.21	0.02	0.00	0.00	0.00	11.40
E	11.46	1.84	0.16	0.00	0.00	0.00	13.46
SE	9.54	3.19	1.13	0.12	0.00	0.00	13.99
S	8.90	2.40	0.18	0.02	0.00	0.00	11.51
SW	2.48	1.43	0.16	0.00	0.00	0.00	4.07
W	0.93	0.60	0.28	0.02	0.00	0.00	1.84
NW	2.21	1.67	0.66	0.04	0.00	0.00	4.57
Sub-Total	57.87	15.54	2.84	0.22	0.01	0.00	76.47
Calm							23.52
Total							100

The dominant wind direction is from the north (approximately 16% of the time), followed by the southeast (approximately 14%). When the predominant wind direction is from the northeast, air quality stations TSP-1 and TSP-2 are located downwind of the DSTF and the crusher. When the wind blows from the southeast those same stations are upwind from the DSTF and crusher. Given these generalities TSP-1 and TSP-2 may capture influences from facilities when the wind is from the northeast but are otherwise not downwind. Air quality station TSP-3, located on the outskirts of Keno City, is east of these potential dust sources. Based on Table 4-5, westerly winds only occur about 2% of the time (or roughly 10% of the time when combining northwest, west, and southwest), so the DSTF and crusher are expected to have very limited influence on air quality in Keno City (TSP-3).

4.3.1 2021 Wind Analysis

Hourly wind speed and direction was collected between January 2021 and December 2021, at the Keno District Mill weather station. The wind rose plot in Figure 4-2 depicts this information based on 36 wind direction categories. The average wind speed is 1.29 m/s and winds are calm roughly 22% of the time. Note that the wind sensor experienced occasional icing during the winter months and extended periods of zero wind speed were excluded from this analysis. Also, winter wind speeds may occasionally be underestimated due to the presence of ice on the sensor, but these occurrences cannot be detected in the data record. Wind speed and direction frequency distribution are compiled in Table 4-6 below and are based on eight wind direction categories and six wind speed categories.

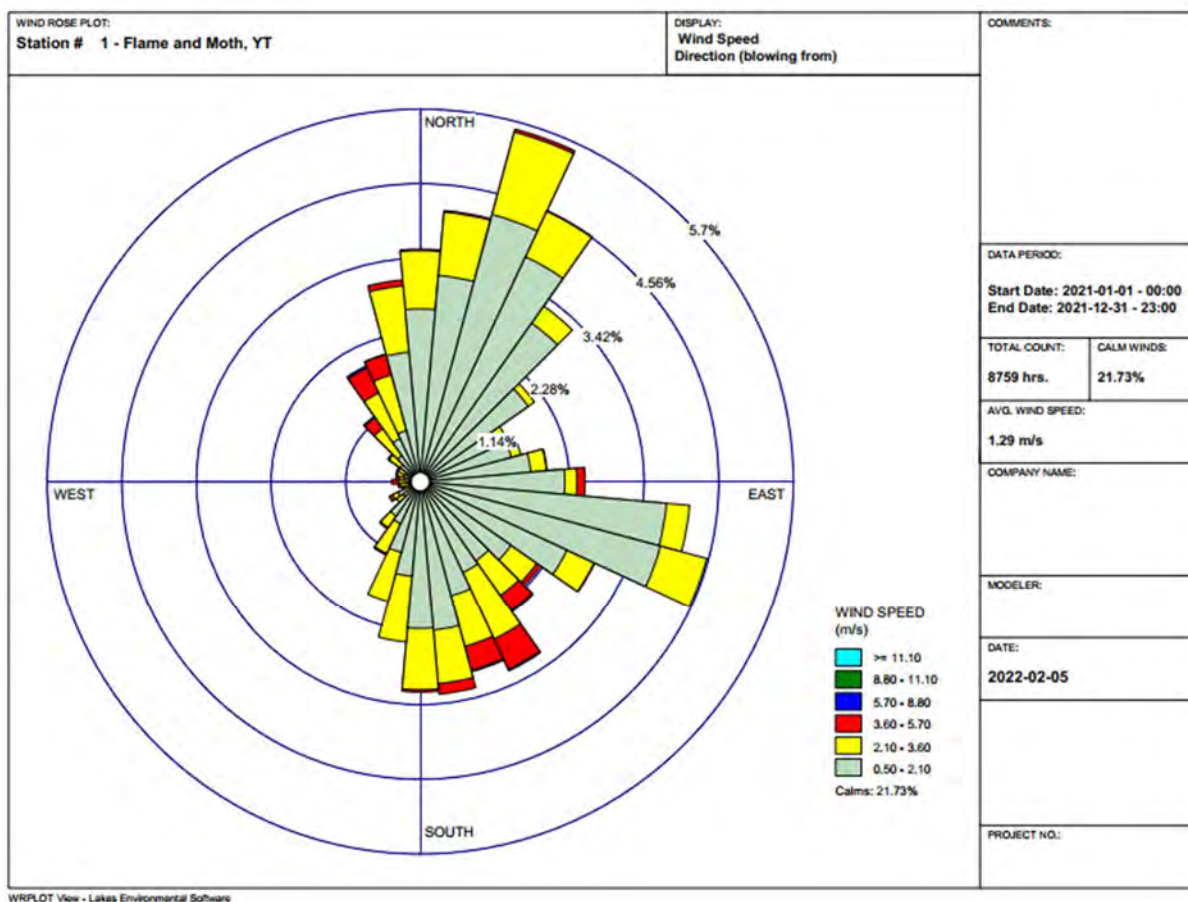


Figure 4-2: Wind Rose (direction blowing from), Keno District Mill Weather Station, January 2021 – December 2021

Table 4-6: Wind Frequency Distribution Keno District Mill, January 2021 – December 2021

Directions / Wind Classes (m/s)	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total (%)
N	11.86	4.61	0.46	0.01	0.00	0.00	16.94
NE	11.25	1.62	0.02	0.00	0.00	0.00	12.89
E	11.90	1.45	0.14	0.00	0.00	0.00	13.48
SE	8.29	3.24	1.04	0.05	0.00	0.00	12.62
S	8.20	3.88	0.41	0.02	0.00	0.00	12.51
SW	2.25	1.07	0.11	0.00	0.00	0.00	3.44
W	0.80	0.63	0.22	0.00	0.00	0.00	1.64
NW	2.11	1.87	0.70	0.07	0.00	0.00	4.75
Sub-Total	56.65	18.38	3.09	0.15	0.00	0.00	78.27
Calm							21.73
Total							100

In 2021, the dominant wind direction was from the north (Figure 4-2). These results do not greatly deviate from the June 2011 to December 2021 results.

5 PM₁₀ SAMPLING BY YUKON GOVERNMENT

Independent PM₁₀ sampling was conducted by Yukon Government in 2013 at the locations shown in Figure 1-1. The station labelled BG represents background (8 km outside of Keno), stations labelled KC are in Keno City, stations labelled HR are along the Bellekeno Haul Road and stations labelled FL are fence line stations and correspond to TSP-1 and TSP-2 locations. Five-minute data averaged over the different sampling periods are presented in Table 5-1 below. The sampling period varies between sites (ranges from about 14 to 53 hours) but for comparison purposes, the average results are all below the 24-hr YAAQS of 50 µg/m³. Note that in some cases the measured background PM₁₀ concentration is higher than that measured at some of the receptors. For example, during the July 15-17 sampling event site HR1 measured coarse particulate matter at 5.2 µg/m³ and the background at 10.2 µg/m³. This suggests there is some variability in the data and that the difference between background and receptors sites may not be significant. Results are generally comparable to the PM₁₀ concentrations measured by AKHM at stations TSP-1, TSP-2, and TSP-3 (August 2015 to December 2021).

Table 5-1: Average Coarse Particulate Matter (PM₁₀) Concentrations

Site Locations	PM ₁₀ (µg/m ³)		
	June 11-13, 2013	July 15-17, 2013	August 21-22, 2013
BG	2.8	10.2	3.8
KC1	6.2	NS	NS
KC2	3.8	NS	NS
KC3	8.3	NS	NS
KC4	2.1	NS	NS

HR1	NS	5.2	NS
HR2	NS	2.1	NS
HR3	NS	13.8	NS
HR4	NS	16.4	NS
FL1	NS	NS	0.8
FL2	NS	NS	39.3

Source: Yukon Government, 2014

NS: Not Sampled

Data presented in Table 5-1 were obtained from Yukon Government and not collected by AKHM and, therefore, details of the collection have not been presented within this report. The data is assumed to be accurate and valid, but potentially not representative of all conditions observed over a year, due to the limited dataset.

6 RECOMMENDATIONS

As outlined in the Dust Abatement and Monitoring Plan (AKHM, 2021), AKHM will make the following changes to its air quality monitoring program in 2022:

- A new sampler should be purchased to replace the missing sampler at the TSP-1 location. The sampler located at TSP-1 should be relocated to the western limit of Keno City to characterize ambient concentrations at sensitive receptors in Keno City. Of the six discrete receptors used in the model, receptor R05 (located at the western end of Keno City) is where the highest concentrations were estimated;
- The sampler located at TSP-3 will be relocated to the eastern end of Keno City to provide an understanding of how ambient concentrations vary throughout town;
- The sampler located at TSP-2 remains in operation at the same location to provide information on ambient concentrations within the Project area and to provide data continuity as this site has been monitored for TSP since August 2012; and
- Monitoring will be increased from running for 9 days a month to 18 days per month for one year and a statistical analysis will be completed to evaluate the appropriate monitoring frequency.

7 CONCLUSION

- All TSP samples collected to date near the District Mill, DSTF, and Keno City were below the Yukon air quality standard for TSP, except for one sample collected at TSP-1 (July 1, 2015) which was determined to be an outlier.
- All PM₁₀ and PM_{2.5} samples collected to date at the three monitoring locations are less than their respective YAAQS, except for three samples: a TSP-3 PM_{2.5} sample recorded on July 15, 2017 (determined to be outlier), a PM_{2.5} sample recorded on July 9, 2019, and a PM_{2.5} sample recorded on June 22, 2021. The 2019 result may be due to the Shanghai Creek wildfire. The wildfire was near Elsa and Keno City in July and August causing poor air quality conditions.

- In 2021, all parameters met AAQC criteria except for one cadmium exceedance of $0.1736 \mu\text{g}/\text{m}^3$ recorded at TSP-3 on May 19, 2021.
- Air quality samples will continue to be collected per the current monitoring schedule to identify if these infrequent events are associated with any trends or patterns.
- Blanks will continue to be collected along with regular samples to ensure that no sample contamination is occurring during handling, transportation, or lab analysis.

8 REFERENCES

AKHM (Alexco Keno Hill Mining Corp.). (2021). *Keno Hill Silver District Mining Operations Dust Abatement and Monitoring Plan*. October 2021.

Ensero (Ensero Solutions Canada, Inc.). (2021). *Field Protocol: Ambient Air Quality Installation and Standard Operating Procedure*. Prepared for Alexco Keno Hill Mining Corp. March 15, 2021.

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.

Attachment A:

Results and Meteorological Data (2012-2021)

Includes Sub-attachments:

A1: 24-Hour Average TSP Results, Meteorological Conditions, and Site Activities, Aug. 2012 – Dec. 2021

A2: Average PM10 and PM2.5 Results (24-Hour), Aug. 2015 – Dec. 2021

A3: Metal Concentrations (24-Hour), TSP-1, Aug. 2012 – Dec. 2020

A4: Metal Concentrations (24-Hour), TSP-2, Aug. 2012 – Dec. 2021

A5: Metal Concentrations (24-Hour), TSP-3, December 2014 – Dec. 2021

ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
8/23/2012	10.1	12.8		13.11	10.25	6.84	75.31	0	0.68	29.5	3.42	6.6	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
9/27/2012	<5.6	<5.6		8.18	5.23	2.42	62.53	4.5	4.28	124.7	14.27	145.1	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
9/29/2012	<5.6	<5.6		5.69	4.28	2.27	60.46	0	2.33	129.7	8.48	155.9	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
10/16/2012	5.8	-		1.65	0.24	-2.12	89.17	0.8	0.9	32.6	6.26	75.9	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
10/17/2012	<5.6	-		-0.04	-2.84	-8.45	76.89	0.1	1.26	58.8	7.19	159.2	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
10/23/2012	53.2	-		-9.97	-14.04	-17.54	78.41	0	0.66	43.2	3.28	17	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
12/15/2012	<5.6	13.6		-13.59	-15.89	-19.29	88.8	0	0.2	357.4	1.85	5.7	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
1/14/2013	<5.6	-		-3.02	-8.34	-11.78	95.04	0	0.28	284.8	1.43	189.92	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
1/16/2013	<5.6	<5.6		-15.96	-18.61	-20.79	84.83	0	1.26	70.2	4.52	36.1	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
3/23/2013	<5.6	18.2		-3.01	-10.79	-18.99	51.87	0	1.65	28.3	7.48	148.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
3/24/2013	<5.6	23.2		0.17	-4.17	-9.93	57.7	0.2	2.61	78.3	11.11	131.7	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
3/25/2013	<5.6	13.5		3.26	-0.18	-1.98	60.02	0.2	3.57	83.1	12.47	135.8	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
3/26/2013	9.6	11.1		-1.96	-7.27	-17.97	64.66	0.1	3.53	29	10.49	152.2	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
4/7/2013	-	17.1		3.46	-3.18	-12.29	65.38	2.2	2.96	94.8	10.32	145	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
4/10/2013	5.7	7.2		-2.04	-6.54	-11.32	67.42	2.6	2.51	256.1	8.09	199.2	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill

* Starting October 15, 2013, total precipitation is reported rather than total rain

Note: - indicates no data recorded; n/a = not applicable/not available

ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
4/13/2013	<5.6	6.9		-5.93	-12.43	-19.03	45.43	0	1.96	10.6	6.29	26.6	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
4/15/2013	6.5	6.5		-1.9	-7.18	-13.58	53.95	0	2.18	42.3	7.95	103.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
4/16/2013	7.2	6.4		0.44	-3.52	-8.62	69.65	0.1	2.14	64.3	7.03	73.8	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
5/28/2013	6.8	-		19.47	14.39	9.06	49.38	1.6	1.74	23.9	6.95	353.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/16/2013	8.2	-		23.38	17.3	11.35	47.8	3.4	1.94	7.2	12.71	357.9	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/17/2013	-	<5.6		14.07	10.7	7.39	50.03	0	3.05	16.8	10.87	344	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/18/2013	47.2	6.3		21.94	15.07	7.66	47.63	0	1.65	97.3	6.13	136.7	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/21/2013	7.2	<5.6		17.66	13.9	10.38	79.66	6.6	1.42	344.9	6.83	177	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/23/2013	-	<5.6		18.44	12.68	7.82	76.09	9.4	1.65	23.7	9.54	306.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/24/2013	<5.6	-		23.85	15.91	6.54	59.11	0	1.72	15.1	5.33	336.8	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
6/28/2013	-	62.2		23.98	18.36	12.73	65.86	10.5	1.67	51.2	10.37	140.4	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
7/19/2013	5.6	<5.6		20.14	14.74	9.64	65.78	0.1	1.42	2.3	6.15	196.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
7/20/2013	12.2	<5.6		17.94	12.89	7.1	72.14	0.8	1.66	27.6	6.36	304.1	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
7/21/2013	<5.6	<5.6		15.94	13.17	11.18	70.77	0.6	1.57	41.9	5.25	11.6	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
7/22/2013	<5.6	10.1		20.87	15.55	11.04	56.74	0	1.57	18.9	5.79	209.89	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/22/2013	<5.6	<5.6		14.14	7.63	1.62	69.1	0	1.76	7.6	6.41	245.32	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/23/2013	<5.6	-		8.68	6.55	4.21	91.68	6.6	0.85	17.8	3.18	108.3	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/24/2013	<5.6	-		8.03	5.92	3.43	75.82	0.3	2.61	60.9	8.73	87.5	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/25/2013	<5.6	<5.6		8.4	5.09	1.8	75.02	0	1.29	16.8	4.03	17.2	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/26/2013	-	<5.6		10.85	6.73	3.85	82.06	1	1.36	41.4	5.22	324.4	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/28/2013	-	7.2		17.01	8.66	1.14	61.42	0	1.38	73.5	6.5	145.7	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
8/31/2013	-	<5.6		9.51	7.68	5.12	91.35	4.7	1.01	22.5	4.9	191.41	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
9/21/2013	-	<5.6		2.64	0.6	-0.96	96.45	6.6	0.92	356.8	3.41	27.7	No mining operations, Exploration activities at Flame & Moth
9/24/2013	<5.6	<5.6		1.7	0.38	-2.3	89.58	0	1.68	17.2	6.2	220.9	No mining operations, Care and Maintenance

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Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
9/27/2013	<5.6	<5.6		6.66	3.26	1.15	84.55	2.8	1.25	50.8	7.66	137.4	No mining operations, Care and Maintenance
9/28/2013	<5.6	<5.6		7.32	3.73	0.07	69.19	0	1.14	55.2	5.51	78.8	No mining operations, Care and Maintenance
9/29/2013	<5.6	-		6.77	3.58	1.28	60.97	0	2.18	63.6	7.7	92.1	No mining operations, Care and Maintenance
9/30/2013	-	6		6.19	3.22	1	63.34	0	1.64	49.8	5.32	84.6	No mining operations, Care and Maintenance
10/24/2013	-	<5.6		-4.58	-6.99	-10.1	95.67	0	0.77	48.1	3.78	238.21	No mining operations, Care and Maintenance
10/25/2013	7.6	<5.6		-3.58	-5.09	-7.52	96.9	0	0.47	43.3	2.99	31.6	No mining operations, Care and Maintenance
10/26/2013	<5.6	<5.6		-0.68	-4.9	-8.64	95.13	1.2	1.19	79.3	4.02	152.5	No mining operations, Care and Maintenance
10/27/2013	6.8	<5.6		-5.73	-7.6	-9.98	95.57	0	0.71	44.1	2.77	15.1	No mining operations, Care and Maintenance
10/28/2013	<5.6	-		0.21	-3.79	-5.96	97.83	0	0.97	19.7	5.27	25.8	No mining operations, Care and Maintenance
11/28/2013	7.8	8.8		-5.9	-10.14	-15.55	91.67	2.3	1.53	22.8	8.22	202.58	No mining operations, Care and Maintenance
11/29/2013	7.6	7.5		-16.84	-22.52	-27.23	81.85	0.1	1.04	111.6	3.7	159.4	No mining operations, Care and Maintenance
11/30/2013	8.9	8.5		-25.99	-27.76	-29.67	77.52	0	0.37	75.8	1.95	97.3	No mining operations, Care and Maintenance
12/1/2013	6.7	7.2		-29.46	-30.57	-32.06	74.69	0	0.54	103.8	3.58	114.7	No mining operations, Care and Maintenance
1/3/2014	13.2	11.8		-20.82	-24.67	-28.26	80.16	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/4/2014	12.6	9.3		-23.86	-27.58	-29.03	77.62	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/5/2014	18.6	11.4		-11.47	-15.47	-22.96	88.97	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/6/2014	11.9	11		-10.08	-10.91	-11.81	92.77	2.3	0	239.5	0.17	239.47	No mining operations, Care and Maintenance
2/1/2014	9.7	11.9		-13.87	-15.42	-16.72	89.15	0	0.17	68.5	1.26	41.1	No mining operations, Care and Maintenance
2/2/2014	<5.6	<5.6		-10.84	-13.88	-16.51	90.43	0	0.7	54.6	2.99	45.8	No mining operations, Care and Maintenance
2/3/2014	<5.6	<5.6		-13.05	-16.23	-18.55	88.38	0	0.71	8.2	4.06	12.8	No mining operations, Care and Maintenance
2/4/2014	<5.6	6.4		-16.81	-19.32	-20.81	85.64	0	0.31	66.7	2.22	19.1	No mining operations, Care and Maintenance
3/5/2014	<5.6	<5.6		-13.83	-18.81	-21.99	54.48	0	1.1	59.6	3.62	124	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
3/6/2014	<5.6	<5.6		-14.55	-20.5	-26.02	61.57	0	1.24	36.8	4.91	117.7	No mining operations, Care and Maintenance
3/7/2014	<5.6	<5.6		-15.31	-21.47	-26.79	62.8	0	0.84	38.6	3.17	5.5	No mining operations, Care and Maintenance
3/25/2014	<5.6	<5.6		-1.15	-9.04	-16.37	41.09	0	2.09	39.8	5.68	79.2	No mining operations, Care and Maintenance
4/12/2014	<5.6	<5.6		1.63	-6.67	-14.67	40.6	0	1.38	23.9	4.11	241.38	Exploration activities at Flame & Moth
4/13/2014	6.8	8.1		5.29	-0.4	-6.75	39.56	0.4	1.16	34.5	4.06	355.5	Exploration activities at Flame & Moth
4/14/2014	18.8	20.3		8.44	3.51	-0.45	45.57	0.1	1.43	56.6	5.66	15.6	Exploration activities at Flame & Moth
4/15/2014	15.7	14.4		8.6	3.21	-1.58	56.03	0	1.46	31.1	6.69	133.6	Exploration activities at Flame & Moth
5/11/2014	21.9	23.2		13.32	7.67	2.564	40.33	0.4	1.81	3.5	6.44	302.1	Exploration activities at Flame & Moth
5/12/2014	14.4	10		15.92	9.23	1.645	40.14	0.2	1.55	10.5	6.13	209.7	Exploration activities at Flame & Moth
5/13/2014	<5.6	18.6		17.93	11.47	4.408	47.25	0.2	2.2	335.7	8.58	194.22	Exploration activities at Flame & Moth
5/29/2014	17.1	<5.6		17.05	10.5	2.236	58.36	1.2	1.64	3.6	7.38	314.9	Exploration activities at Flame & Moth
6/26/2014	<5.6			15.56	11.04	5.062	48.68	0.4	2.02	79.7	7.96	150.5	Exploration activities at Flame & Moth
6/27/2014	<5.6	5.6		18.11	12.96	8.05	48.56	0	1.42	34.9	5.67	322.6	Exploration activities at Flame & Moth
6/28/2014		<5.6		23.06	16.15	6.332	38.97	0.4	2.11	328.2	7.94	285.6	Exploration activities at Flame & Moth
6/29/2014	<5.6	<5.6		24.93	17.07	7.576	40.23	0.2	1.9	35	6.44	336.1	Exploration activities at Flame & Moth
6/30/2014	<5.6	<5.6		17.12	14.37	12.5	67.69	0	1.12	47.7	6.95	92.8	Exploration activities at Flame & Moth
7/8/2014	<5.6	<5.6		16.39	12.98	8.98	63.26	0	1.57	326.4	6.45	223.65	Exploration activities at Flame & Moth
7/27/2014	<5.6	<5.6		16.61	11.39	8.41	83.5	2.8	1.11	228.9	5.3	334.3	Exploration activities at Flame & Moth
7/28/2014	<5.6	<5.6		18.93	12.56	7.43	68.18	0.6	1.36	220.2	6.31	151.2	Exploration activities at Flame & Moth
7/29/2014	<5.6	<5.6		15.18	12.05	9.11	79.4	3.4	1.69	211.1	6.9	320.3	Exploration activities at Flame & Moth
8/22/2014	<5.6	<5.6		14.95	10.31	6.149	76.43	0	1.35	44.2	5.99	16.6	Exploration activities at Flame & Moth
8/23/2014	6.9	16.7		16.65	10.05	4.659	78.54	1.5	1.37	59.5	4.99	143.45	Exploration activities at Flame & Moth

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
8/24/2014	<5.6	5.6		14.83	9.69	5.429	74.6	0	1.6	55.6	5.76	354.8	Exploration activities at Flame & Moth
8/25/2014	<5.6			12.09	9.4	7.071	86.62	1.1	0.73	18.6	3.96	354	Exploration activities at Flame & Moth
8/26/2014		<5.6		11.48	8.22	5.645	91.57	16	0.65	51.2	4.1	193.15	Exploration activities at Flame & Moth
9/20/2014	<5.6	<5.6		8.42	6.1	4.174	77.89	0	1	58.8	5.53	94.3	Exploration activities at Flame & Moth
9/23/2014	5.6	6.9		4.986	0.95	-1.977	88.36	0.7	1.51	271.1	7.22	194.91	Exploration activities at Flame & Moth
9/24/2014	5.6	6.9		4.955	-0.44	-3.427	76.34	0.4	1.28	22.7	4.81	221.03	Exploration activities at Flame & Moth
9/27/2014	5.6	<5.6		4.42	0.96	-1.406	89.84	3.5	1.42	32.8	8.05	166	Exploration activities at Flame & Moth
10/15/2014	9.7	18.1		-0.86	-3.51	-5.65	87.21	0.1	0.88	25.4	3.51	30.7	Exploration activities at Flame & Moth
10/16/2014	<5.6	<5.6		-0.581	-1.62	-3.093	89.96	0	1.1	28.4	4.97	25.6	Exploration activities at Flame & Moth
10/23/2014	<5.6	<5.6		-3.667	-4.97	-5.752	89.54	0	0.93	30.2	4.95	34.6	Exploration activities at Flame & Moth
10/24/2014	<5.6	<5.6		-2.715	-4.57	-5.456	95.21	0	0.79	39.2	3.81	171.6	Exploration activities at Flame & Moth
11/19/2014	10			-2.206	-3.73	-5.562	97.74	0	0.45	50.3	2.98	187.456	No mining operations, Care and Maintenance
11/20/2014	<5.6			-4.7	-10	-15.01	93.46	0	0.49	124.5	2.75	117	No mining operations, Care and Maintenance
11/22/2014		<5.6		-18.86	-19.79	-21.6	85.38	0.2	0.22	12.2	1.61	29.1	No mining operations, Care and Maintenance
11/23/2014		5.8		-17.53	-19.71	-22.09	85.39	0.1	0.15	14.1	2.55	17	No mining operations, Care and Maintenance
11/24/2014	<5.6			-14.55	-16.44	-18.21	88.27	0.1	0.18	45	1.58	28.1	No mining operations, Care and Maintenance
11/25/2014	10.4	8.1		-11.02	-12.48	-13.85	91.5	0	0.18	30.3	1.31	40.8	No mining operations, Care and Maintenance
12/12/2014	10.3	7.8		-11.81	-14.01	-16.65	90.33	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/13/2014	5.8	11.7	16	-11.22	-14.47	-17.02	89.88	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/14/2014		5.6	<5.6	-2.637	-10.17	-15.75	93.13	0.1	n/a	n/a	0.04	46.8	No mining operations, Care and Maintenance
12/15/2014	<5.6	<5.6	<5.6	-0.904	-1.88	-4.157	85.83	0	0.78	48.5	8.87	155.1	No mining operations, Care and Maintenance
12/17/2014	<5.6			-5.392	-6.76	-8.51	94.93	0	0.55	69.5	3.02	38.6	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
1/10/2015	5.6	<5.6		-9.46	-10.34	-10.97	93.47	0	0.09	251.9	1.42	10.3	No mining operations, Care and Maintenance
1/11/2015	<5.6	<5.6		-9.37	-10.03	-10.63	93.32	0	0.11	65.4	1.26	33.4	No mining operations, Care and Maintenance
1/12/2015			<5.6	-9.68	-10.29	-11.46	93.2	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/13/2015	<5.6	<5.6		-6.068	-8.44	-11.23	94.59	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/15/2015	6.1	<5.6	<5.6	-0.888	-5.06	-9.68	96.82	0	0.22	356.6	3.7	38.4	No mining operations, Care and Maintenance
1/16/2015			<5.6	-0.335	-2.85	-7.954	98.1	0	1.14	346.9	4.48	187.95	No mining operations, Care and Maintenance
1/18/2015			<5.6	-3.823	-6.18	-8.51	96	0.2	0.69	60.2	4.21	170.8	No mining operations, Care and Maintenance
2/12/2015		6.3	8.6	-11.62	-13.95	-15.81	89.23	0	0.37	19.4	3.26	272	No mining operations, Care and Maintenance
2/13/2015	<5.6	<5.6		-6.289	-8.23	-11.42	93.9	0	0.52	24.5	4.93	37.9	No mining operations, Care and Maintenance
2/15/2015	7.1	<5.6	8.8	-3.145	-6.33	-9.71	92.52	7.3	0.73	98.5	3.04	97.7	No mining operations, Care and Maintenance
2/16/2015	<5.6	<5.6	7.9	-2.157	-7.74	-11.49	93.95	0.7	0.85	15.9	4.61	30.5	No mining operations, Care and Maintenance
2/18/2015	<5.6		11.5	-0.889	-2.64	-4.515	96.48	0	0.42	29.1	3.69	7.9	No mining operations, Care and Maintenance
3/6/2015	7.1	7.8	<5.6	-0.298	-3.66	-5.577	86.59	0.1	1.37	322.7	6.53	188.22	No mining operations, Care and Maintenance
3/7/2015	<5.6	<5.6	<5.6	0.932	-2.44	-4.272	78.47	0.2	1.42	30.5	6.22	180.242	No mining operations, Care and Maintenance
3/16/2015	6.7	<5.6	9	-12.89	-19.53	-26.15	73.31	0	0.89	14.5	3.84	17	No mining operations, Care and Maintenance
3/17/2015	<5.6	<5.6	16.5	-1.807	-9.23	-13.81	72.37	0.3	0.93	28.9	4.24	24	No mining operations, Care and Maintenance
4/2/2015	<5.6	<5.6	<5.6	4.032	-1.57	-5.899	66.26	0	1.7	27.7	4.94	71	No mining operations, Care and Maintenance
4/3/2015	<5.6	<5.6	<5.6	2.002	-2.72	-7.184	58.66	0	2.35	16.5	7.17	88.7	No mining operations, Care and Maintenance
4/4/2015	<5.6	<5.6	5.7	3.513	-3.7	-10.48	61.55	0	1.53	71	6.57	152.2	No mining operations, Care and Maintenance
4/5/2015	<5.6	<5.6	5.8	3.213	-2.1	-5.496	84.15	0	1.2	345.9	7.63	247.74	No mining operations, Care and Maintenance
5/21/2015			<5.6	23.83	16.28	7.585	34.05	0	1.73	13	5.17	238.3	No mining operations, Care and Maintenance
5/22/2015			<5.6	25.09	17.82	10.28	29.16	0	1.71	25.5	6.02	300.9	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
5/23/2015			8.8	26.43	19.79	12.86	26.79	0	1.36	18.1	9.86	184.223	No mining operations, Care and Maintenance
5/24/2015			9.9	26.51	19.2	11.59	32.85	0	1.79	91.6	7.59	167.6	No mining operations, Care and Maintenance
5/25/2015	15.8	18.9		25.12	17.97	10.28	38.93	0	2.05	1.8	8.18	180.742	No mining operations, Care and Maintenance
5/26/2015	22.2	26.4		21.73	15.55	9.78	53.49	0	1.79	32.8	9.22	90.9	No mining operations, Care and Maintenance
5/27/2015	15.8	15		22.99	16.43	11.38	52.67	0	2.18	351.8	8.63	24	No mining operations, Care and Maintenance
5/28/2015	6.3	5.8		20.98	14.38	8.42	62.4	0	1.94	333.9	10.63	269	No mining operations, Care and Maintenance
6/16/2015	<5.6	<5.6	<5.6	19.74	13.76	6.668	51.79	0.9	1.75	21.2	10.14	354.4	No mining operations, Care and Maintenance
6/17/2015	<5.6	9.3	<5.6	15.41	11.36	6.976	63.5	0	2.66	357.7	9.73	337.9	No mining operations, Care and Maintenance
6/18/2015	<5.6	<5.6	<5.6	18.34	11.65	4.589	42.59	0	2.27	349.6	7.18	316.9	No mining operations, Care and Maintenance
7/1/2015		<5.6	68.1	15.59	11.07	7.143	76.46	1.4	1.58	304.9	7.87	205.51	No mining operations, Care and Maintenance
7/8/2015	15.4	32.1	43.8	17.01	12.85	10.73	80.11	3.2	1.68	276.1	11.49	257.07	No mining operations, Care and Maintenance
7/11/2015	<5.6	7.6	<5.6	14.04	12.35	10.35	75.27	9.5	1.01	39	5.52	152.4	No mining operations, Care and Maintenance
7/20/2015	9.6	5.7	13.1	17.42	11.86	4.725	62.55	0	2.03	2	9.09	318.7	No mining operations, Care and Maintenance
8/13/2015	6.8	10.4		14.48	7.56	0.308	64.18	0	1.56	4.2	6.06	322.4	No mining operations, Care and Maintenance
8/14/2015	11.4	<5.6	9.7	16.49	9.14	3.399	70.07	0	1.67	34.3	6.71	224.49	No mining operations, Care and Maintenance
8/15/2015	7.4	9	6.4	18.97	11.31	4.551	63.45	0	1.67	1.3	5.93	215.3	No mining operations, Care and Maintenance
8/16/2015	11	8.6	6.5	16.31	11.81	8.21	64.84	0	1.52	298.6	6.48	207.91	No mining operations, Care and Maintenance
9/17/2015	5.7	<5.6		8.56	5.26	3.57	83.42	4.4	1.69	121.4	6.94	142.7	No mining operations, Care and Maintenance
10/20/2015	6	<5.6	5.6	3.167	1.32	-1.097	89.12	0	0.99	90.8	5.45	120.4	No mining operations, Care and Maintenance
10/21/2015	<5.6	8.2	<5.6	2.824	0.27	-1.349	89.93	0	0.7	23.8	5.71	140.6	No mining operations, Care and Maintenance
11/13/2015	21.4	14	16	-11.46	-12.67	-14.95	91.27	2.4	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
11/15/2015	10.3	10	8.5	-14.97	-16.71	-19.11	88	1	n/a	n/a	0.09	205.82	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
11/16/2015	10.8	12.2	6.9	-14.95	-16.51	-18.04	88.14	0.2	0.36	19.4	2.93	26	No mining operations, Care and Maintenance
11/17/2015	17.8	20.8		-17.84	-18.96	-22.21	85.9	0.3	0.69	20.9	2.99	20.7	No mining operations, Care and Maintenance
11/18/2015	9.7	17.4		-22.09	-25.52	-29.1	79.53	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/16/2015	<5.6		<5.6	-15.9	-17.77	-21.21	87.08	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/17/2015	<5.6		<5.6	-12.54	-17.25	-19.91	87.61	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/18/2015	<5.6		<5.6	-10.93	-11.8	-12.91	91.85	0.1	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/19/2015	<5.6		<5.6	-11.73	-12.75	-14.99	90.93	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
1/5/2016	<5.6		<5.6	-12.1	-14.93	-16.42	89.23	0	0.41	49.4	2.1	76.3	No mining operations, Care and Maintenance
1/6/2016	<5.6		<5.6	-14.12	-15.06	-15.93	85.37	0	0.21	47.1	1.59	30.3	No mining operations, Care and Maintenance
1/7/2016			<5.6	-14.34	-15.65	-16.56	79.81	4	0.33	64.8	2.2	36.4	No mining operations, Care and Maintenance
1/8/2016	<5.6			-15.34	-16.32	-17.01	79.46	0	0.51	88.9	2.41	140.3	No mining operations, Care and Maintenance
2/26/2016	<5.6		<5.6	-2.88	-6.39	-9.04	89.98	0	0.83	44.7	3.82	14.3	No mining operations, Care and Maintenance
2/27/2016	<5.6		<5.6	-0.499	-3.86	-5.51	89.43	0.2	0.9	18.1	5.08	341.7	No mining operations, Care and Maintenance
2/28/2016	<5.6		<5.6	-0.842	-2.71	-5.93	76.81	0	1.14	30.8	6.79	139.1	No mining operations, Care and Maintenance
3/12/2016	<5.6	<5.6	<5.6	3.148	-2.98	-7.6	62.41	0.2	1.07	68.3	4.02	90.3	No mining operations, Care and Maintenance
3/14/2016	<5.6	<5.6	<5.6	-4.622	-6.39	-9.43	83.42	0	1.14	17.3	3.71	21.7	No mining operations, Care and Maintenance
3/15/2016	<5.6	<5.6	<5.6	-3.963	-6.65	-9.78	91.08	0.1	0.77	25.8	3.96	45.1	No mining operations, Care and Maintenance
4/19/2016	<5.6	<5.6	<5.6	4.494	0.18	-5.34	60.59	0	1.58	13.4	6.15	318.7	No mining operations, Care and Maintenance
4/23/2016	<5.6	<5.6	<5.6	12.14	5.94	0.67	67.36	0.5	1.25	74.3	5.66	111.3	No mining operations, Care and Maintenance
4/24/2016	<5.6	<5.6	<5.6	13.5	7.5	2.87	59.67	0	1.27	32.3	5.58	64.8	No mining operations, Care and Maintenance
5/23/2016	<5.6	<5.6	<5.6	15.41	10.35	2.5	55.84	0	1.95	10.5	6.47	319.6	No mining operations, Care and Maintenance
5/25/2016	10.6	<5.6	<5.6	9.99	7.54	5.79	64.33	0.2	2.36	359.9	8.15	339.7	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
6/13/2016	<5.6	<5.6	<5.6	14.65	10.54	6.45	73.67	1.1	1.33	26.6	4.77	339	No mining operations, Care and Maintenance
6/17/2016	<5.6	<5.6	<5.6	21.96	15.16	8.18	37.44	0	1.9	8.8	7.63	317.6	No mining operations, Care and Maintenance
6/19/2016	9.7	22.6	6.1	25.98	18.97	9.57	35.04	0	2.41	292.5	9.21	198.7	No mining operations, Care and Maintenance
7/28/2016	<5.6	<5.6	<5.6	18.66	14.78	10.16	67.43	1.7	1.57	61.8	7.73	236.2	No mining operations, Care and Maintenance
7/29/2016	<5.6	<5.6	<5.6	15.55	11.73	7.72	88.27	2.7	0.95	61.3	4.2	238.4	No mining operations, Care and Maintenance
7/30/2016	<5.6	<5.6	<5.6	15.5	12.59	9.46	78.82	0.6	1.44	285.4	6.19	233.8	No mining operations, Care and Maintenance
8/9/2016	<5.6	<5.6	<5.6	12.96	11.51	9.52	93.48	8.5	1.17	302.7	5.5	194.6	No mining operations, Care and Maintenance
8/10/2016	<5.6	<5.6	<5.6	11.59	9.94	8.94	91.5	2.9	1.31	355.7	7.75	255.8	No mining operations, Care and Maintenance
8/11/2016	<5.6	<5.6	<5.6	16.77	11.59	7.05	75.82	0.1	0.87	337.9	5.6	228.3	No mining operations, Care and Maintenance
9/28/2016	<5.6	<5.6	<5.6	5.192	0.46	-2.5	67.44	0	1.38	79.8	5.88	178.1	No mining operations, Care and Maintenance
9/29/2016	<5.6	<5.6	<5.6	3.332	0.51	-3.57	67.16	0.2	2.12	349.2	8.03	309.6	No mining operations, Care and Maintenance
9/30/2016	<5.6	<5.6	<5.6	3.833	-1.67	-6.18	65.93	0	1.35	48.9	4.13	209.7	No mining operations, Care and Maintenance
10/5/2016	8.8	6.7	5.7	1.857	-4.62	-8.16	70.26	0	1.36	59.1	3.94	111.7	No mining operations, Care and Maintenance
10/7/2016	<5.6		<5.6	1.909	-4.42	-8.66	67.82	0	1.41	74.1	3.65	126.2	No mining operations, Care and Maintenance
10/10/2016	<5.6		13.5	0.07	-5.24	-9.03	75.16	0	1.27	74.9	3.26	102.4	No mining operations, Care and Maintenance
10/27/2016		<5.6		-5.793	-8.05	-10.39	89.97	0.3	0.96	39.1	3.35	16.5	No mining operations, Care and Maintenance
11/26/2016	<5.6	<5.6	<5.6	-8.12	-13.62	-17.72	89.97	0	0.45	20.1	3.97	23.1	No mining operations, Care and Maintenance
11/27/2016	<5.6	6.1	7.6	-6.422	-6.91	-8.06	95.25	0	0.45	39.6	3.59	37.4	No mining operations, Care and Maintenance
11/28/2016	<5.6	<5.6	<5.6	-6.707	-8.32	-13.37	94.16	1.3	0.34	119.1	4.63	179.3	No mining operations, Care and Maintenance
12/27/2016	<5.6	<5.6	<5.6	-11.02	-11.92	-14.1	91.65	0	0.05	51	1.2	63.8	No mining operations, Care and Maintenance
12/29/2016	<5.6	<5.6	<5.6	-14.61	-16.92	-19.94	87.48	0	0.12	147.9	1.53	184.4	No mining operations, Care and Maintenance
12/30/2016	<5.6	<5.6	<5.6	-14.31	-16.67	-18.52	87.67	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance

* Starting October 15, 2013, total precipitation is reported rather than total rain

Note: - indicates no data recorded; n/a = not applicable/not available

ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
1/28/2017	<5.6	<5.6	<5.6	-2.812	-4.68	-6.23	77.47	0	1.36	19.2	5.45	23.8	No mining operations, Care and Maintenance
1/29/2017	<5.6	<5.6	<5.6	-3.933	-7.42	-12.29	93.13	0	1.41	335.4	5.89	193.2	No mining operations, Care and Maintenance
1/30/2017	<5.6	<5.6	<5.6	-12.36	-16.09	-19.73	84.55	0	1.06	96.9	3.83	112.3	No mining operations, Care and Maintenance
2/2/2017		<5.6		-20.22	-21.79	-23.16	83.14	0	0.35	7.5	2.25	90.9	No mining operations, Care and Maintenance
2/14/2017	<5.6	<5.6		4.767	3.12	0.27	62.56	18.1	3.42	108.6	11.61	138.2	No mining operations, Care and Maintenance
2/18/2017	8.8	6.5	<5.6	-9.24	-14.62	-16.86	79.32	0	0.73	53.2	3.41	96.2	No mining operations, Care and Maintenance
2/19/2017	<5.6	<5.6	<5.6	-10.69	-15.61	-17.89	78.99	0	0.68	59.2	3.7	108.8	No mining operations, Care and Maintenance
2/20/2017			<5.6	-11.48	-15.99	-18.31	80.63	0	0.69	49.4	2.89	98.1	No mining operations, Care and Maintenance
3/23/2017		<5.6		-5.982	-12.3	-16.98	74.85	0	1.23	21.8	3.92	350.1	No mining operations, Care and Maintenance
3/25/2017	<5.6			-9.14	-13.94	-17.87	73.19	0	2.52	14.7	5.84	336.3	No mining operations, Care and Maintenance
3/27/2017	<5.6	<5.6		-1.321	-8.92	-16.19	68.59	0.1	1.43	55.2	7.7	92	No mining operations, Care and Maintenance
3/28/2017	<5.6	<5.6		2.596	-2.91	-7.28	78.33	0.7	1.72	57.2	6.25	169.5	No mining operations, Care and Maintenance
4/14/2017	5.7	<5.6		5.503	-1.28	-8.49	58.58	0	1.52	8.3	7.33	262.9	No mining operations, Care and Maintenance
4/18/2017	<5.6	6.5		-1.935	-8.36	-15.36	40.66	0	2.07	39.7	10.23	343.8	No mining operations, Care and Maintenance
4/20/2017	<5.6	5.7		-3.151	-8.49	-14.59	42.05	0	2.66	1.5	6.63	321.3	No mining operations, Care and Maintenance
5/25/2017	<5.6	<5.6		13.56	8.74	4.31	59.86	0	1.61	31.2	7.19	254.5	No mining operations, Care and Maintenance
5/26/2017	<5.6	<5.6		7.391	3.62	0.76	80.44	5.6	2.19	281	10.29	249.3	No mining operations, Care and Maintenance
5/30/2017	<5.6	11.1		17.42	12.48	8.6	46.99	0	2.4	347.7	8.74	206.5	No mining operations, Care and Maintenance
6/1/2017	<5.6	<5.6		12.23	9.09	5.07	60.89	0	2.38	63.3	6.83	94.3	No mining operations, Care and Maintenance
6/8/2017	<5.6	6.1		25.34	20.56	14.96	29.44	0.5	2.07	76.2	7.33	85.1	No mining operations, Care and Maintenance
6/9/2017	<5.6	<5.6		24.13	19.01	12.95	45.12	0	1.78	11.4	9.34	287.6	No mining operations, Care and Maintenance
6/13/2017	<5.6	<5.6		10.14	4.91	-0.9	38.16	0	2.18	42.5	13.32	335.6	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
6/15/2017			<5.6	14.9	10.39	2.94	38.74	0	1.27	70.2	5.5	79.5	No mining operations, Care and Maintenance
6/16/2017			<5.6	16.56	11.43	4.81	50.45	0	1.59	15.8	8.91	311.5	No mining operations, Care and Maintenance
6/20/2017			9.9	20.64	14.23	8.78	51.8	0	1.68	321.7	9.28	206.9	No mining operations, Care and Maintenance
7/4/2017		8.5		20.37	15.89	9.55	42.58	0	2	16.7	7.96	338.3	No mining operations, Care and Maintenance
7/5/2017		7.6		24.54	17.32	8.12	39.77	0.8	1.52	31.5	5.25	331.7	No mining operations, Care and Maintenance
7/7/2017		10.6		27.18	20.31	11.61	38.51	0.1	1.62	53.7	6.76	178.4	No mining operations, Care and Maintenance
7/18/2017	8.5		9.7	20.81	13.1	8.32	82.36	1.9	1.37	46.2	13.65	349.3	No mining operations, Care and Maintenance
7/20/2017			6	20.7	15.78	9.53	63.3	0.2	1.79	11.1	9.43	284.1	No mining operations, Care and Maintenance
7/21/2017			<5.6	17.26	13.2	10.8	79.06	1	1.43	29.5	10.42	253.4	No mining operations, Care and Maintenance
7/25/2017	12.5			20.81	16.42	11.24	60.04	0	1.71	35.7	8.58	335.3	No mining operations, Care and Maintenance
7/27/2017	<5.6			14.94	11.75	8.44	77.83	0	1.71	47.7	5.46	96.9	No mining operations, Care and Maintenance
8/2/2017	8.8		6.1	21.73	15.44	9.3	60.75	0	1.8	354.7	7.21	193.4	No mining operations, Care and Maintenance
8/4/2017	<5.6		<5.6	19.12	15.31	10.51	60.32	0	1.72	1.9	6.17	203.7	No mining operations, Care and Maintenance
8/6/2017	11.7		6.1	24.03	16.57	9.37	49.23	0	1.48	25.7	6.35	222.8	No mining operations, Care and Maintenance
8/9/2017		41.1		28.31	19.3	11.34	45.48	0	1.75	39.7	5.73	219.6	No mining operations, Care and Maintenance
8/11/2017		17.8		22.04	16.94	12.9	50.64	0	1.76	99.7	8.07	163.6	No mining operations, Care and Maintenance
8/15/2017		<5.6		12.01	7.92	4.54	81.39	0.3	1.27	341	5.75	199.9	No mining operations, Care and Maintenance
9/20/2017	7.6	7.2	7.1	10.76	7.23	4.57	75.59	0	0.88	23.8	4.29	345.6	No mining operations, Care and Maintenance
9/26/2017		<5.6	<5.6	6.973	3.16	-0.17	81.17	0.1	1.37	46.7	4.24	12.2	No mining operations, Care and Maintenance
9/27/2017	7.1			9.4	4.85	2.43	85.17	1.4	1.72	55.6	9.86	143.6	No mining operations, Care and Maintenance
9/29/2017	6.7	<5.6	<5.6	8.55	3.54	-0.46	84.7	0.4	1.14	71	3.71	352.7	No mining operations, Care and Maintenance
10/3/2017	<5.6	<5.6	<5.6	6.991	4.19	1.17	66.06	0	0.9	63.5	3.47	6.4	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
10/5/2017	<5.6	<5.6	<5.6	9	4.97	2.37	80.66	4.7	1.56	112.6	6.03	154.4	No mining operations, Care and Maintenance
10/6/2017	<5.6	<5.6	<5.6	6.152	3.33	-0.21	86.92	0.3	1.19	353.3	6.01	347.3	No mining operations, Care and Maintenance
11/2/2017	<5.6			-10.4	-11.79	-14.32	90.97	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
11/16/2017	<5.6			-19.45	-20.55	-21.31	83.8	0	0.22	26.7	2.28	120.7	No mining operations, Care and Maintenance
11/17/2017	<5.6			-19.7	-21	-23.24	83.29	0	0.3	29.3	2.08	36.9	No mining operations, Care and Maintenance
11/30/2017		<5.6	<5.6	-9.73	-11.89	-13.8	91.4	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/5/2017		<5.6	<5.6	-5.088	-6.78	-8.39	94.24	0.8	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/7/2017		<5.6	<5.6	3.777	0.39	-1.82	90.97	3.7	1.94	113.9	11.65	142.3	No mining operations, Care and Maintenance
12/12/2017		<5.6	<5.6	-3.688	-6.4	-8.45	86.7	0	1.15	100.2	4.75	168.2	No mining operations, Care and Maintenance
12/13/2017	<5.6			-5.324	-8.94	-12.34	94.1	0.4	0.89	43.8	4.35	43.4	No mining operations, Care and Maintenance
12/15/2017	<5.6			-0.017	-2.54	-6.63	98.31	2.7	0.65	n/a	2.4	166.2	No mining operations, Care and Maintenance
12/19/2017	<5.6			-10.78	-13.18	-15.23	90.91	0	n/a	n/a	n/a	n/a	No mining operations, Care and Maintenance
12/20/2017	<5.6		<5.6	-10.64	-13.18	-15.75	90.9	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
12/21/2017		<5.6		-12.8	-14.28	-16.66	90.1	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
12/24/2017		<5.6	<5.6	-20.24	-21.89	-23.4	83.5	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
12/26/2017		<5.6		-14	-16.83	-20.1	87.8	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
12/28/2017			<5.6	-22.05	-23.34	-25.35	81.7	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
12/29/2017	<5.6			-23.53	-24.69	-25.99	80.5	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
1/2/2018	<5.6	<5.6	<5.6	-17.77	-21.06	-24.85	83.8	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
1/3/2018	<5.6	<5.6	<5.6	-8.86	-12	-17.82	91.6	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
1/4/2018	<5.6	<5.6	<5.6	-3.568	-6.759	-10.68	95.5	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
1/11/2018	<5.6	<5.6	<5.6	-29.94	-32.17	-34.3	72.05	0	0	n/a	0	n/a	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
1/18/2018	<5.6	<5.6	<5.6	2.077	-3.636	-9.47	70.06	0	0.79	220.9	3.254	293.6	No mining operations, Care and Maintenance
1/23/2018	<5.6	<5.6	<5.6	-16.02	-18.05	-19.86	86.4	0	0	n/a	0	n/a	No mining operations, Care and Maintenance
1/31/2018	<5.6	<5.6	<5.6	-20.77	-23.8	-26.18	77.53	0	2.81	192.4	7.213	194.5	No mining operations, Care and Maintenance
2/7/2018	<5.6	<5.6	<5.6	-23.2	-27.88	-30.68	76.39	0	0.407	219.8	2.519	192.2	No mining operations, Care and Maintenance
2/9/2018	<5.6	<5.6		-21.7	-24.92	-27.68	75.69	0	0.346	202.2	1.862	329.1	No mining operations, Care and Maintenance
2/10/2018			<5.6	-21.9	-26.24	-29.05	76.55	0	0.285	233.1	2.283	209	No mining operations, Care and Maintenance
2/14/2018	<5.6	<5.6	7.2	-10.29	-14.59	-17.29	87.7	0	0.985	229.6	2.754	271.3	No mining operations, Care and Maintenance
2/15/2018	<5.6	<5.6	<5.6	-14.19	-17.94	-20.59	83.6	0	0.258	198.1	1.999	199.1	No mining operations, Care and Maintenance
2/20/2018	<5.6	<5.6	<5.6	-13.48	-16.68	-19.24	85.5	0	0.981	190	7.801	53.28	No mining operations, Care and Maintenance
2/21/2018	<5.6	<5.6	<5.6	-7.666	-12.93	-16.87	87.7	0	2.24	206.8	7.556	57.43	No mining operations, Care and Maintenance
2/22/2018	<5.6	<5.6	<5.6	-5.597	-11.28	-16.38	76.97	0	0.654	227.1	3.567	296.9	No mining operations, Care and Maintenance
2/23/2018	<5.6	<5.6	<5.6	-10.39	-12.79	-15.82	88.2	0	1.17	254.8	7.605	75.33	No mining operations, Care and Maintenance
2/27/2018	<5.6	<5.6	<5.6	-12.56	-16.81	-19.73	82.2	0	0.623	233.4	3.508	322.5	No mining operations, Care and Maintenance
3/1/2018	<5.6	<5.6	<5.6	-14.97	-18.85	-22.31	67.1	0	1.304	219.9	4.606	201	No mining operations, Care and Maintenance
3/2/2018	<5.6	<5.6	<5.6	-13.68	-22.47	-26.45	64.83	0	1.001	235.6	3.861	209	No mining operations, Care and Maintenance
3/6/2018	<5.6	<5.6	<5.6	-11.09	-17.24	-21.55	75.15	0.2	0.955	200.4	3.371	282.6	No mining operations, Care and Maintenance
3/8/2018	<5.6	<5.6	<5.6	-9.8	-14.65	-18.45	75.38	0.4	1.424	237.7	5.047	259.7	No mining operations, Care and Maintenance
3/13/2018	<5.6	<5.6	<5.6	2.905	-1.687	-5.331	52.33	0.6	1.566	199.7	4.782	201.2	No mining operations, Care and Maintenance
3/15/2018	<5.6	8.7	<5.6	11.19	2.594	-1.832	62.47	0.7	1.284	217.3	6.203	110.4	No mining operations, Care and Maintenance
3/16/2018	<5.6	<5.6	<5.6	8.27	1.377	-2.342	73.8	0.1	0.971	222.6	4.008	187.7	No mining operations, Care and Maintenance
3/20/2018	<5.6	<5.6	<5.6	2.731	-2.026	-6.887	70.84	0	2.006	227.3	8.16	225.8	No mining operations, Care and Maintenance
3/21/2018	<5.6	<5.6	<5.6	-2.753	-5.636	-9.05	64.22	0	3.028	240.6	9.13	257.7	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
4/3/2018	<5.6	<5.6	12.6	-8.43	-11.97	-16.8	46.03	0	1.974	227.6	7.742	272.8	No mining operations, Care and Maintenance
4/4/2018	<5.6	<5.6	<5.6	-7.616	-14.89	-20.62	46.75	0	1.567	232.8	7.134	293	No mining operations, Care and Maintenance
4/5/2018	<5.6	<5.6	<5.6	-4.383	-13.63	-21.68	49.47	0	1.468	248.5	7.664	327.4	No mining operations, Care and Maintenance
4/10/2018		6.8	<5.6	3.482	-4.219	-11.3	46.21	0	2.111	235.5	9.28	273.2	No mining operations, Care and Maintenance
4/11/2018		<5.6	<5.6	5.638	-0.33	-8.02	50.97	0	1.739	264.9	6.948	315.3	No mining operations, Care and Maintenance
4/12/2018	<5.6	<5.6	<5.6	9.78	2.492	-1.88	52.16	0	1.008	240.5	4.077	327.7	No mining operations, Care and Maintenance
4/17/2018	<5.6	<5.6	<5.6	-1.369	-10.33	-17.82	37.8	0	1.407	219.1	4.792	162.3	No mining operations, Care and Maintenance
4/19/2018	<5.6	<5.6	<5.6	4.731	-5.377	-12.12	44.68	0	1.64	201.5	5.517	160.1	No mining operations, Care and Maintenance
4/20/2018	<5.6			1.881	-4.589	-12.95	48	0	1.605	205.7	8.79	6.711	No mining operations, Care and Maintenance
4/24/2018	<5.6			6.318	2.829	0.45	64.47	0	2.319	268.3	8.58	329.8	No mining operations, Care and Maintenance
4/26/2018	<5.6	<5.6	<5.6	9.08	4.068	-0.925	46.54	0	1.372	222.2	5.733	105.2	No mining operations, Care and Maintenance
5/1/2018	<5.6	<5.6	<5.6	8.74	3.581	-1.079	61.55	0	1.321	166.8	6.605	44.72	No mining operations, Care and Maintenance
5/3/2018	<5.6	<5.6	<5.6	1.493	-0.761	-4.476	92.8	8.5	1.435	247.8	6.458	333.9	No mining operations, Care and Maintenance
5/8/2018	<5.6	<5.6	<5.6	6.926	2.424	-1.006	70.64	2.8	1.604	275.1	5.811	300	No mining operations, Care and Maintenance
5/9/2018		<5.6		13.97	4.963	-3.265	51.91	1.5	1.286	220.4	5.782	302.9	No mining operations, Care and Maintenance
5/10/2018			<5.6	16.93	9.41	1.081	40.14	0	1.957	271.6	7.664	332.5	No mining operations, Care and Maintenance
5/15/2018	<5.6	<5.6	<5.6	8.09	2.989	0.68	91.2	6.7	0.833	224.5	4.684	180.5	No mining operations, Care and Maintenance
5/22/2018	<5.6	<5.6	<5.6	12.9	8.59	4.599	66.06	1.5	2.908	279.8	8.91	3.516	Flame and Moth development and Care and Maintenance at other sites
5/24/2018	<5.6	2.8	<5.6	14.14	8.17	3.204	56.99	0	1.255	195	9.56	344.4	Flame and Moth development and Care and Maintenance at other sites
5/26/2018	<5.6		<5.6	14.29	6.597	2.294	68.15	0.2	1.584	200.4	6.713	140	Flame and Moth development and Care and Maintenance at other sites

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
5/27/2018		5.7	<5.6	12.95	6.717	0.28	63.54	3.4	1.528	132.6	7.379	187.7	Flame and Moth development and Care and Maintenance at other sites
6/5/2018	<5.6		<5.6	17.56	11.68	6.132	58.24	0	1.356	228.7	7.722	271.6	Flame and Moth development and Care and Maintenance at other sites
6/6/2018	<5.6		<5.6	15.27	9.47	6.681	73.84	3.9	0.961	195.2	4.675	2.386	Flame and Moth development and Care and Maintenance at other sites
6/8/2018	<5.6		<5.6	13.94	7.995	4.234	78.94	3.2	1.149	195.8	5.037	151.1	Flame and Moth development and Care and Maintenance at other sites
6/11/2018	<5.6		<5.6	15.4	9.1	3.168	59.9	0.7	1.198	155.8	9.05	45.53	Flame and Moth development and Care and Maintenance at other sites
6/13/2018	<5.6		<5.6	15.33	9.16	3.967	63.04	0	1.763	151.5	6.517	15.94	Flame and Moth development and Care and Maintenance at other sites
6/14/2018			<5.6	15.35	10.38	4.373	52.95	0	1.65	165.4	6.36	55.49	Flame and Moth development and Care and Maintenance at other sites
6/19/2018	<5.6		<5.6	25.17	17.37	11.27	45.09	0	1.523	146.4	8.56	136.6	Flame and Moth development and Care and Maintenance at other sites
6/20/2018	<5.6		<5.6	22.58	16.99	9.93	47.75	1.8	1.457	179.6	7.703	250.1	Flame and Moth development and Care and Maintenance at other sites
6/21/2018			<5.6	25.47	16.89	6.766	55.76	0.6	1.467	262.1	8.9	327	Flame and Moth development and Care and Maintenance at other sites
6/22/2018		<5.6		28.51	19.08	12.81	44.39	0.4	2.305	80.64	8.82	14.97	Flame and Moth development and Care and Maintenance at other sites
6/26/2018	<5.6	<5.6		18.37	11.25	3.459	71.78	3.1	1.605	217.9	5.968	150.3	Flame and Moth development and Care and Maintenance at other sites
7/3/2018			<5.6	19.5	12.45	5.41	64.46	1.9	1.364	180.4	7.477	173.1	Flame and Moth development and Care and Maintenance at other sites
7/4/2018			<5.6	20.96	13.44	5.519	63.67	0.1	2.269	155.4	10.06	60.14	Flame and Moth development and Care and Maintenance at other sites
7/6/2018			<5.6	19.5	14.66	8.5	46.85	0	1.762	146.8	6.625	76.48	Flame and Moth development and Care and Maintenance at other sites

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 ($\mu\text{g}/\text{m}^3$)	TSP-2 ($\mu\text{g}/\text{m}^3$)	TSP-3 ($\mu\text{g}/\text{m}^3$)	Maximum Air Temperature ($^{\circ}\text{C}$)	Mean Air Temperature ($^{\circ}\text{C}$)	Minimum Air Temperature ($^{\circ}\text{C}$)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction ($^{\circ}$)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed ($^{\circ}$)	Activities at site
7/10/2018			<5.6	20.06	15.79	12.04	47.65	0	2.028	300.3	8.61	328.7	Flame and Moth development and Care and Maintenance at other sites
7/11/2018			<5.6	17.4	12.56	8.6	61.01	6.3	1.929	162.1	8.92	15.82	Flame and Moth development and Care and Maintenance at other sites
7/12/2018			<5.6	17.39	10.93	7.336	75.51	2.5	1.636	205.7	7.997	107.2	Flame and Moth development and Care and Maintenance at other sites
7/13/2018	<5.6		<5.6	17.16	10.44	3.58	68.2	0	1.653	173.3	6.938	144.1	Flame and Moth development and Care and Maintenance at other sites
7/17/2018	<5.6		<5.6	13.2	8.93	6.197	86	11.3	1.041	221.1	6.556	102.4	Flame and Moth development and Care and Maintenance at other sites
7/18/2018	<5.6		5.8	17.06	9.33	5.835	84.6	4.3	1.282	168.3	5.88	168.3	Flame and Moth development and Care and Maintenance at other sites
7/24/2018	<5.6		6.9	26.58	17.31	11.24	52.87	0.1	1.532	214.9	6.674	43.67	Flame and Moth development and Care and Maintenance at other sites
7/26/2018	<5.6	34.9		29.01	19.41	11.04	41.71	0	2.021	141.2	7.664	25.33	Flame and Moth development and Care and Maintenance at other sites
7/27/2018	<5.6	9.9		27.41	18.97	11.24	42.93	0	1.947	140.2	7.203	68.43	Flame and Moth development and Care and Maintenance at other sites
7/31/2018		17.1		27.16	17.97	9.47	47.31	0	1.668	222.3	11.04	128	Flame and Moth development and Care and Maintenance at other sites
8/1/2018	<5.6			26.12	17	11.31	57.43	2	1.161	156.8	6.566	82.9	Flame and Moth development and Care and Maintenance at other sites
8/2/2018			<5.6	26.82	18.03	9.95	54.92	0	1.711	159.3	17.1	89.8	Flame and Moth development and Care and Maintenance at other sites
8/3/2018				23.89	16.56	12.37	65.1	0.9	0.934	201.1	4.557	200.2	Flame and Moth development and Care and Maintenance at other sites
8/4/2018	<5.6		<5.6	19.35	14.2	9.46	74.52	2.1	1.026	165.1	4.606	8.25	Flame and Moth development and Care and Maintenance at other sites
8/5/2018		<5.6		14.73	12.4	10.8	89.5	8.6	1.561	180.6	6.047	22.61	Flame and Moth development and Care and Maintenance at other sites

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
8/6/2018			<5.6	17.5	12.72	10.31	89.7	3.6	1.521	167.2	6.86	24.34	Flame and Moth development and Care and Maintenance at other sites
8/7/2018	<5.6	<5.6	<5.6	16.36	12.19	10.07	88	2.9	0.974	198.1	6.762	22.55	Flame and Moth development and Care and Maintenance at other sites
8/8/2018		<5.6	<5.6	15.83	11.44	8.69	87.2	20.2	1.118	217.3	6.399	4.31	Flame and Moth development and Care and Maintenance at other sites
8/17/2018	<5.6	<5.6	<5.6	14.46	8.84	4.09	80.6	0.1	1.836	187.8	9.34	60.18	Flame and Moth development and Care and Maintenance at other sites
8/18/2018		<5.6	<5.6	10.23	6.836	3.253	85.6	1.9	1.983	108.8	9.17	52.15	Flame and Moth development and Care and Maintenance at other sites
8/20/2018		<5.6	<5.6	18.46	10.9	3.702	62.5	0	1.529	170.8	7.036	8.11	Flame and Moth development and Care and Maintenance at other sites
8/21/2018	<5.6	10	<5.6	20.81	14.06	8.6	64.58	0	1.63	274.9	8.21	334.3	Flame and Moth development and Care and Maintenance at other sites
8/22/2018	<5.6	<5.6		21.91	15.15	10.29	67.48	0.2	1.627	191.5	8.53	337.5	Flame and Moth development and Care and Maintenance at other sites
8/23/2018	7.9	<5.6		14.27	9.01	6.972	88	16.8	1.576	102.1	5.919	27.36	Flame and Moth development and Care and Maintenance at other sites
8/25/2018	<5.6			10.22	6.52	2.828	92.2	4.1	1.577	226.6	6.644	129.5	Flame and Moth development and Care and Maintenance at other sites
8/26/2018	6.7			12.89	8.16	2.731	83	2.4	1.707	163.1	6.468	32.1	Flame and Moth development and Care and Maintenance at other sites
9/2/2018	<5.6	<5.6	<5.6	10.7	3.297	-3.314	76.05	0.3	2.042	230.2	10.51	146	Flame and Moth development and Care and Maintenance at other sites
9/3/2018	<5.6	<5.6	<5.6	7.869	4.126	-0.97	70	1	1.602	189.8	7.928	12.66	Flame and Moth development and Care and Maintenance at other sites
9/5/2018	<5.6	<5.6	<5.6	11.22	7.083	4.282	73	5.3	0.562	220.8	4.969	185	Flame and Moth development and Care and Maintenance at other sites
9/6/2018	<5.6	<5.6	5.6	9.76	5.046	1.52	89.4	0.4	1.081	233.6	4.43	71.58	Flame and Moth development and Care and Maintenance at other sites

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
9/7/2018	<5.6	<5.6	<5.6	9.76	4.749	0.924	85.5	0	1.63	233.9	6.39	266.1	Flame and Moth development and Care and Maintenance at other sites
9/9/2018	<5.6	<5.6	<5.6	12.45	4.741	-1.783	65.15	0	1.511	198.5	5.537	124.1	Flame and Moth development and Care and Maintenance at other sites
9/10/2018	<5.6	<5.6	<5.6	13.8	5.578	-1.006	57.21	0	2.177	195	6.997	158.1	Flame and Moth development and Care and Maintenance at other sites
9/11/2018	<5.6	<5.6	<5.6	12.66	6.037	0.766	52.38	0	1.781	198.9	6.419	226.1	Flame and Moth development and Care and Maintenance at other sites
9/12/2018	<5.6	<5.6	<5.6	8.56	2.232	-2.305	45.9	0	1.346	201	4.341	33.92	Flame and Moth development and Care and Maintenance at other sites
10/03/2018				6.692	-1.208	-5.38	51.29	0	1.448	12.21	3.577	289	Flame and Moth development and Care and Maintenance at other sites
10/05/2018				4.534	-2.66	-8.08	56.46	0	1.152	27.27	4.243	300.3	Flame and Moth development and Care and Maintenance at other sites
10/07/2018				0.935	-3.467	-7.314	53.84	0	2.261	71.17	6.703	274.3	Flame and Moth development and Care and Maintenance at other sites
10/08/2018				-2.852	-7.155	-12.41	65.21	0	1.29	319.71	5.106	195.2	Flame and Moth development and Care and Maintenance at other sites
10/24/2018				7.845	3.324	-1.82	79.21	0	1.886	294.78	10.43	316.1	Flame and Moth development and Care and Maintenance at other sites
10/25/2018		2.8	2.8	8.01	4.607	0.596	57.76	0	2.915	350.76	10.45	333.2	Flame and Moth development and Care and Maintenance at other sites
10/26/2018	2.8	2.8	2.8	7.011	3.262	0.086	63.37	0	1.397	301.93	7.762	322.1	Flame and Moth development and Care and Maintenance at other sites
10/30/2018	2.8	5.6	2.8	-2.415	-6.82	-9.65	79.84	0	0.634	63.48	2.45	307.9	Flame and Moth development and Care and Maintenance at other sites
10/31/2018	2.8			-4.917	-6.713	-9.25	93.6	0	0.599	286.71	4.479	346.8	Flame and Moth development and Care and Maintenance at other sites
11/07/2018	2.8	2.8	2.8	-17.86	-20.26	-22.45	84.3	0	0.352	322.68	2.176	318.3	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
11/08/2018	2.8	2.8		-16.4	-19.66	-22.55	84.8	0	0.285	57.2	1.931	339.9	No mining operations, Care and Maintenance
11/09/2018			2.8	-9.49	-13.43	-19.61	89.9	0	0.315	292.83	2.744	192.3	No mining operations, Care and Maintenance
11/15/2018	2.8	2.8	14.7	-11.8	-15.51	-20.44	85	0	3.028	51.25	9.79	202	No mining operations, Care and Maintenance
11/18/2018	2.8			-12.66	-16.45	-20.72	87.6	0	0.403	59.23	2.411	170.1	No mining operations, Care and Maintenance
11/19/2018				-8.42	-11.62	-14.8	91.6	0	0.355	57.13	2.421	212.9	No mining operations, Care and Maintenance
11/21/2018				1.579	0.073	-1.312	96.3	0	0.439	n/a	3.41	122.6	No mining operations, Care and Maintenance
11/22/2018				-0.254	-2.923	-4.954	97.3	0	0	n/a	0	0	No mining operations, Care and Maintenance
11/23/2018				-4.941	-7.187	-9.83	95.7	0	0	n/a	0	0	No mining operations, Care and Maintenance
11/28/2018				2.828	0.677	-3.581	82	0	1.781	319.7	9.01	320.6	No mining operations, Care and Maintenance
11/30/2018				-3.325	-4.106	-5.694	96.9	0	0.292	279.51	2.558	356.1	No mining operations, Care and Maintenance
12/04/2018				-11.74	-16.04	-19.83	88.4	0	0.409	325.94	3.998	344.2	No mining operations, Care and Maintenance
12/07/2018				-9.47	-15.19	-19.61	89	0	0.351	39.55	2.577	258	No mining operations, Care and Maintenance
12/10/2018				2.125	0.859	-0.496	67.85	0	3.919	296.62	13.45	327.1	No mining operations, Care and Maintenance
12/11/2018				-0.763	-3.102	-9.05	81.9	0	1.903	309.37	7.664	324.2	No mining operations, Care and Maintenance
12/12/2018				-0.763	-3.102	-9.05	81.9	0	1.903	359.61	7.664	319.6	No mining operations, Care and Maintenance
12/13/2018				-8.48	-11.5	-14.15	90.5	0	0.897	7.13	3.322	275.6	No mining operations, Care and Maintenance
12/14/2018				-10.96	-14.18	-17.34	88.5	0	0.796	338.86	3.695	241.4	No mining operations, Care and Maintenance
12/18/2018		5.7	2.8	-1.576	-3.757	-5.72	71.46	0	1.025	1.31	4.753	14.58	No mining operations, Care and Maintenance
12/26/2018		6.8	6.7	-24.57	-26.82	-27.92	77.75	0	0.321	49.67	2.372	209.7	No mining operations, Care and Maintenance
12/27/2018	7.9	6.9		-21.66	-23.42	-25.06	81.1	0	0.378	54.69	2.656	290.7	No mining operations, Care and Maintenance
12/28/2018	2.8		7.8	-14.64	-18.92	-22.93	85.5	0	0.265	359.5	2.597	237.8	No mining operations, Care and Maintenance
12/30/2018	2.8			-11.95	-16.35	-20.83	87.5	0	0.539	350.96	2.421	282.1	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
01/10/2019	8.3	6.7	7.4	-24.49	-26.87083333	-30.48	77.95458333	0	0.195291667	247.125	2.156	355.8	No mining operations, Care and Maintenance
01/15/2019		7.8	7.6	-11.24	-12.59	-13.97	90.98333333	0	0.000291667	9.125	0.372	219	No mining operations, Care and Maintenance
01/17/2019	7.6	7.1	6.5	-7.955	-8.797291667	-9.78	93.83333333	0	0	0	0	0	No mining operations, Care and Maintenance
01/22/2019	7.8	8.3		-19.68	-23.18833333	-27.11	81.6	0	0	0	0	0	No mining operations, Care and Maintenance
01/24/2019				-14.15	-17.78333333	-19.34	86.29166667	0	0	0	0	0	No mining operations, Care and Maintenance
01/25/2019				-7.034	-10.31008333	-14.29	92.57083333	0	0	0	0	0	No mining operations, Care and Maintenance
01/29/2019				-9.4	-13.64541667	-16.68	90.08333333	0	0.277583333	201.1041667	2.342	330.2	No mining operations, Care and Maintenance
01/30/2019				-8.95	-13.7325	-19.7	86.86333333	0	1.542625	163.5	6.399	237.3	No mining operations, Care and Maintenance
01/31/2019				-20.23	-23.74833333	-26.83	72.5925	0	1.899833333	225.0583333	5.723	264.8	No mining operations, Care and Maintenance
02/07/2019				-18.34	-20.36	-22.9	84.31666667	0	0.364083333	248.4666667	2.029	330.2	No mining operations, Care and Maintenance
02/08/2019				-15.76	-18.39	-20.57	85.94166667	0	0.4845	239.8916667	3.116	332.5	No mining operations, Care and Maintenance
02/21/2019				-14.18	-16.91875	-18.97	82.025	0	1.657916667	213.6916667	5.909	286.5	No mining operations, Care and Maintenance
02/22/2019				-14.46	-19.28458333	-22.41	73.145	0	1.330666667	221.3541667	4.978	284	No mining operations, Care and Maintenance
02/23/2019				-18.04	-21.61083333	-25.14	77.70916667	0	0.998	231.9680833	3.263	350	No mining operations, Care and Maintenance
02/25/2019				-12.6	-17.09666667	-19.21	78.64541667	0	0.698041667	242.2583333	2.773	295.4	No mining operations, Care and Maintenance
02/26/2019	2.8	2.8	12.9	-9.67	-14.59	-17.76	78.19625	0	0.5995	227.9170833	2.499	336.4	No mining operations, Care and Maintenance
02/27/2019	2.8	2.8	2.8	-7.037	-12.0065	-15.11	78.8	0	0.54175	233.2166667	2.303	333.4	No mining operations, Care and Maintenance
02/28/2019	2.8	2.8	16.2	-6.324	-11.31808333	-14.63	82.06583333	0	0.598916667	221.4125	3.518	323.4	No mining operations, Care and Maintenance
03/05/2019		2.8	6.2	-10.06	-16.27041667	-20.19	65.37416667	0	0.947208333	224.2158333	3.636	281.4	No mining operations, Care and Maintenance
03/06/2019		2.8	2.8	-8.03	-14.92041667	-19.1	57.40583333	0	0.8925	226.7791667	3.489	294.4	No mining operations, Care and Maintenance
03/07/2019		2.8	2.8	-8.78	-14.665	-18.59	61.57208333	0	1.197875	239.2833333	3.322	297.3	No mining operations, Care and Maintenance
03/09/2019	2.8			-5.692	-11.172625	-16.56	64.7425	0	1.044166667	223.0958333	4.577	275.8	No mining operations, Care and Maintenance

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Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
03/12/2019	2.8			2.254	-3.563875	-6.527	69.5725	0	1.170125	212.8429167	4.302	333.9	No mining operations, Care and Maintenance
03/13/2019	2.8			1.848	-4.1465	-9.98	61.66208333	0	1.993833333	297.5166667	8.93	339.6	No mining operations, Care and Maintenance
03/14/2019				3.302	-1.059333333	-4.462	59.0575	0	2.267	270.82375	8.36	359.7	No mining operations, Care and Maintenance
03/19/2019				10.84	6.23775	3.674	53.14833333	0	3.237833333	308.1475	11.77	359.4	No mining operations, Care and Maintenance
03/27/2019				5.028	-0.106041667	-4.954	70.09583333	0	1.245083333	216.0175	5.498	310.9	No mining operations, Care and Maintenance
04/02/2019				1.565	-2.173958333	-8.45	58.46125	0	2.589791667	258.5333333	9.16	281.8	No mining operations, Care and Maintenance
04/04/2019				-4.519	-12.57070833	-19.91	39.09375	0	1.457666667	231.2066667	6.909	357.8	No mining operations, Care and Maintenance
04/09/2019				7.235	3.2065	-2.077	47.27125	0	1.575416667	270.4233333	7.997	354.7	No mining operations, Care and Maintenance
04/11/2019				9.18	3.636458333	-1.373	42.92708333	0	2.046458333	314.2958333	8.23	350.4	No mining operations, Care and Maintenance
04/17/2019				8.96	1.47825	-4.434	60.35208333	0	1.448125	246.592	8.05	334	No mining operations, Care and Maintenance
04/18/2019				5.594	2.828666667	0.351	70.36	0	1.751458333	248.9078333	7.801	356.7	No mining operations, Care and Maintenance
04/19/2019	2.8	2.8		7.499	2.229375	-1.674	60.08666667	0.438	2.265541667	256.18425	6.831	357	No mining operations, Care and Maintenance
04/20/2019	2.8	8.7	2.8	6.688	0.352958333	-5.158	56.12833333	0.292	1.840541667	238.098125	6.948	358.5	No mining operations, Care and Maintenance
04/24/2019			2.8	0.96	-2.374583333	-4.882	75.50083333	1.314	1.810625	141.1084583	8.35	353.3	No mining operations, Care and Maintenance
04/25/2019		2.8		0.827	-3.362958333	-6.81	63.35125	0.73	1.634333333	185.6375	5.41	260.9	No mining operations, Care and Maintenance
04/30/2019			2.8	9.15	3.99175	-2.512	33.26916667	0	2.079625	212.7708333	8.35	293.8	No mining operations, Care and Maintenance
05/01/2019	6.1	2.8	2.8	8.81	5.197666667	1.7	33.94291667	0	2.950375	197.1625	11.64	282.3	No mining operations, Care and Maintenance
05/07/2019	2.8	2.8	2.8	15.15	8.326	0.134	53.54416667	0.73	1.816791667	186.5975	9.89	358.8	No mining operations, Care and Maintenance
05/08/2019			2.8	17.65	11.29129167	7.342	48.36208333	0.292	2.948125	290.4827917	10.3	359.3	No mining operations, Care and Maintenance
05/09/2019		2.8		12.17	8.360666667	3.331	50.14333333	0.438	2.352166667	146.6094583	8.81	359.7	No mining operations, Care and Maintenance
05/14/2019	2.8			16.28	10.91679167	5.083	28.12958333	1.022	1.602	244.7083333	6.801	316.1	No mining operations, Care and Maintenance
05/18/2019				10.95	7.726375	3.783	73.01916667	0.876	0.989458333	193.7770833	4.92	355.6	No mining operations, Care and Maintenance

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ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
05/21/2019				21.25	16.72666667	11.5	31.79333333	0	1.3025	249.7708333	6.556	321.8	No mining operations, Care and Maintenance
05/23/2019				21.29	13.98308333	7.437	44.23041667	0	1.566041667	232.9220833	7.654	333.1	No mining operations, Care and Maintenance
06/04/2019				13.42	9.104041667	3.934	47.03833333	0	2.007166667	186.85	6.517	272.9	No mining operations, Care and Maintenance
06/06/2019				15.9	10.5805	6.499	60.96291667	0.146	1.830416667	186.6345833	8.67	358	No mining operations, Care and Maintenance
06/18/2019				19.38	14.56208333	10.12	60.11375	0	1.923958333	187.6033333	7.046	323.3	No mining operations, Care and Maintenance
06/20/2019				22.07	15.65045833	6.039	38.10625	0	1.724791667	211.0083333	6.38	301.7	No mining operations, Care and Maintenance
06/25/2019				19.23	15.17625	11.19	49.425	0	1.957708333	187.475	10.52	358.6	No mining operations, Care and Maintenance
06/28/2019				20.08	16.84125	14.1	41.73041667	0	1.123416667	159.4652083	5.116	353.6	No mining operations, Care and Maintenance
06/29/2019	23.5	26	23.2	25.09	18.68833333	12.53	52.95666667	0.584	2.162	182.8758333	11.17	303.1	No mining operations, Care and Maintenance
07/03/2019				22.18	16.4325	9.6	39.99375	0	2.028791667	171.4741667	7.272	295.4	No mining operations, Care and Maintenance
07/04/2019				19.89	15.68541667	11.1	67.605	1.168	1.418333333	206.125	8.1	287.9	No mining operations, Care and Maintenance
07/09/2019				21.46	15.44666667	8.28	42.47625	0	1.864041667	202.6333333	6.703	282.3	No mining operations, Care and Maintenance
07/11/2019				19.66	13.62083333	10.8	77.20125	7.878	1.231375	200.5145833	10.68	350.3	No mining operations, Care and Maintenance
07/16/2019				20	14.81875	9.61	64.73666667	0	1.535875	207.8833333	6.556	343.7	No mining operations, Care and Maintenance
07/19/2019				22.76	16.9775	9.6	54.39541667	0	1.653708333	198.1547917	7.438	291.4	No mining operations, Care and Maintenance
07/21/2019		49.4	15.1	22.43	17.07958333	11.22	56.63125	0	1.466916667	218.4291667	5.537	293	No mining operations, Care and Maintenance
07/26/2019	2.8	9.3		17.67	12.58854167	7.242	64.05583333	0	1.530958333	203.3425	5.606	305.3	No mining operations, Care and Maintenance
07/30/2019	2.8	2.8	2.8	18.77	12.2425	8.25	71.22875	0	1.050375	179.0002083	8.38	346.9	No mining operations, Care and Maintenance
07/31/2019	9.6		6.4	18.56	12.50595833	7.046	69.40458333	0	1.209	185.4454167	6.801	356.4	No mining operations, Care and Maintenance
08/01/2019				18.99	11.8195	7.009	74.10791667	2.918	1.389708333	170.7909583	9.81	360	No mining operations, Care and Maintenance
08/06/2019				18.23	11.94854167	7.721	74.81083333	4.085	1.988916667	188.1879167	10.98	351.5	No mining operations, Care and Maintenance
08/08/2019				14.8	8.995166667	3.894	51.97791667	0	2.298125	177.2541667	6.733	278.4	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
08/15/2019				15.56	11.80875	9.01	57.17791667	0	3.489625	105.6720833	9.86	191.5	No mining operations, Care and Maintenance
08/16/2019				8.92	7.203958333	4.712	83.785	4.085	1.228791667	154.379125	6.194	358.1	No mining operations, Care and Maintenance
08/21/2019				11.3	6.336916667	2.046	58.40375	1.022	1.366708333	168.9470417	11.95	355.1	No mining operations, Care and Maintenance
08/22/2019	2.8	2.8	2.8	12.61	4.829041667	-2.778	66.03541667	0.146	1.198458333	175.1840417	5.762	356.7	No mining operations, Care and Maintenance
08/27/2019	2.8	7.9	6.1	16.63	8.097666667	0.956	61.71875	0	1.889458333	145.95	6.88	294.9	No mining operations, Care and Maintenance
08/28/2019	2.8	7.2		15.27	8.420416667	1.319	61.02541667	0	1.564166667	171.4449583	6.145	358.6	No mining operations, Care and Maintenance
08/30/2019			9.7	16.84	9.61075	2.711	61.90166667	0	1.469166667	188.222875	5.811	331.6	No mining operations, Care and Maintenance
09/03/2019				15.1	9.793041667	4.93	74.10166667	0.73	1.239833333	212.310375	7.781	358.8	No mining operations, Care and Maintenance
09/04/2019				13.89	8.2975	2.692	69.73166667	7.733	1.769708333	194.2491667	6.478	345.7	No mining operations, Care and Maintenance
09/05/2019				16.13	9.246416667	4.274	63.15291667	0	1.431291667	220.3025	5.165	349.3	No mining operations, Care and Maintenance
09/10/2019				17.37	12.04745833	5.63	37.35333333	0.292	1.5765	288.1713333	8.77	347.7	No mining operations, Care and Maintenance
09/12/2019				17.19	10.65720833	5.053	49.51708333	0	1.249875	261.565375	6.233	359.6	No mining operations, Care and Maintenance
09/17/2019				9.26	7.0395	4.661	89.8175	0.584	0.950833333	237.0634583	5.9	359.3	No mining operations, Care and Maintenance
09/24/2019	2.8	2.8	2.8	9.91	2.337416667	-2.25	71.89416667	0.2	1.297125	215.505	3.969	353.2	No mining operations, Care and Maintenance
09/25/2019	2.8	2.8	5.8	6.485	2.208125	-0.156	81.61	0	0.854875	230.8291667	4.028	338.1	No mining operations, Care and Maintenance
09/27/2019	11.8	2.8	2.8	4.932	-1.192125	-5.692	64.195	0.1	1.418541667	208.228375	6.399	345.5	No mining operations, Care and Maintenance
10/02/2019				9.26	6.436375	0.814	69.36208333	0	1.595125	247.3634167	7.762	352.9	No mining operations, Care and Maintenance
10/03/2019				5.661	0.994625	-1.64	86.135	0.1	1.120666667	225.2746667	4.528	350.3	No mining operations, Care and Maintenance
10/11/2019				2.553	0.765916667	-0.261	88.97375	0	0.744875	195.3220833	6.429	352	No mining operations, Care and Maintenance
10/15/2019				-6.956	-11.73279167	-15.44	87.225	0	0.9325	214.3479167	5.606	313.7	No mining operations, Care and Maintenance
10/17/2019				-0.439	-3.159375	-4.712	88.31625	0	0.768375	190.2233333	4.753	236.4	No mining operations, Care and Maintenance
10/22/2019				-0.99	-3.084791667	-4.71	90.36666667	0	0.928708333	263.80125	4.351	359.4	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
10/23/2019	2.8	2.8		-2.434	-5.478208333	-9.16	91.50208333	0	1.024791667	185.8808333	4.645	355.7	No mining operations, Care and Maintenance
10/24/2019		2.8	2.8	-1.507	-3.947875	-6.706	94.9625	0	0.778916667	255.3833333	4.057	356.8	No mining operations, Care and Maintenance
10/25/2019	2.8	2.8	2.8	-0.251	-5.003166667	-7.436	91.15125	0	0.9845	307.9083333	3.018	357.1	No mining operations, Care and Maintenance
10/29/2019	2.8		2.8	0.805	-1.501666667	-3.723	98.325	0	0.353583333	281.8958333	2.675	359.4	No mining operations, Care and Maintenance
10/31/2019	2.8			-2.423	-4.637875	-6.819	95.85416667	0	0.926541667	324.0666667	3.303	356.2	No mining operations, Care and Maintenance
11/06/2019				-15.09	-19.33958333	-23.77	83.85416667	0	0.405291667	208.6	3.028	284.5	No mining operations, Care and Maintenance
11/07/2019				-9.33	-12.31875	-15.22	89.16666667	0	1.090833333	195.7875	7.801	230	No mining operations, Care and Maintenance
11/12/2019				-14.1	-16.15541667	-18.05	84.41666667	0	0.460666667	218.5	5.547	359.6	No mining operations, Care and Maintenance
11/14/2019				-15.61	-17.3225	-19.02	84.43291667	0	0.901416667	189.0916667	5.743	219.3	No mining operations, Care and Maintenance
11/19/2019				-10.96	-12.91791667	-15.25	90.40416667	0	0.594416667	240.1170417	3.45	355	No mining operations, Care and Maintenance
11/20/2019				-2.919	-6.004083333	-10.41	95.54583333	0	0.795708333	149.5583333	3.577	238.7	No mining operations, Care and Maintenance
11/21/2019	2.8			-1.681	-3.039916667	-6.409	97.67916667	0	0	0	0	0	No mining operations, Care and Maintenance
11/26/2019	2.8	2.8		-12.69	-13.5875	-14.6	89.97083333	0	0.311208333	228.9333333	2.46	355	No mining operations, Care and Maintenance
11/27/2019	2.8	2.8	2.8	-14.66	-16.97125	-18.73	87.15416667	0	0.6095	266.9041667	3.048	302.2	No mining operations, Care and Maintenance
11/28/2019		2.8		-12.54	-14.64916667	-17.01	89.06666667	0	0.510083333	224.9541667	3.293	326.8	No mining operations, Care and Maintenance
11/29/2019			2.8	-8.82	-10.65416667	-13.46	92.2375	0	0.255583333	144.3166667	3.361	333	No mining operations, Care and Maintenance
12/03/2019				-10.87	-14.07708333	-18.56	89.05833333	0	2.245333333	207.9625	8.25	237.7	No mining operations, Care and Maintenance
12/10/2019				-7.679	-10.99041667	-15.5	92.10416667	0	0.303291667	239.4791667	2.666	308	No mining operations, Care and Maintenance
12/12/2019				-6.312	-9.365708333	-12.85	88.45916667	0	0.847416667	277.5125	6.35	344	No mining operations, Care and Maintenance
12/13/2019				-10.78	-11.06416667	-11.5	89.56666667	0	0.354916667	233.6541667	2.558	343.6	No mining operations, Care and Maintenance
12/18/2019				-20.14	-25.29958333	-28.69	79.55125	0	0.308625	199.9677917	2.871	258.1	No mining operations, Care and Maintenance
12/19/2019				-19.08	-21.23375	-25.53	83.28041667	0	0.627208333	206.0833333	3.185	230.6	No mining operations, Care and Maintenance

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Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
12/24/2019	2.8	2.8	10.4	-10.93	-13.29958333	-15.11	90.175	0	0.229375	258.1041667	1.999	341.1	No mining operations, Care and Maintenance
12/25/2019	5.6	2.8	2.8	-4.349	-7.254791667	-13.49	93.74583333	0	1.201583333	198.7418333	8.42	351.3	No mining operations, Care and Maintenance
12/27/2019		5.7	2.8	-19.77	-24.40541667	-27.26	80.615	0	1.431583333	208.9208333	5.233	262	No mining operations, Care and Maintenance
12/27/2019	-	5.7	2.8	-19.77	-24.405417	-27.26	80.615	0	1.4315833	208.92083	5.233	262	No mining operations, Care and Maintenance
01/08/2020	-	-	-	-24.75	-28.65333333	-32.7	75.42625	0	1.073	200.1708333	4.567	207.9	No mining operations, Care and Maintenance
01/09/2020	-	-	-	-32.55	-33.83916667	-35.21	70.02916667	0	0.3745	203.1716667	2.597	196.1	No mining operations, Care and Maintenance
01/14/2020	-	-	-	-33.56	-34.57625	-36.14	69.29958333	0	0.160125	269.303	1.725	200.6	No mining operations, Care and Maintenance
01/16/2020	-	-	-	-30.28	-31.85416667	-34.05	72.18875	0	0.361875	245.7505417	2.029	214.1	No mining operations, Care and Maintenance
01/23/2020	-	-	-	-11	-13.65458333	-16.44	89.8375	0	0.356	207.6008333	3.459	168	No mining operations, Care and Maintenance
01/24/2020	-	-	-	-12.84	-15.66958333	-18.71	87.87916667	0	0.60025	119.6466667	3.714	8.1	No mining operations, Care and Maintenance
01/26/2020	-	-	-	-19.52	-22.07208333	-25.36	82.29333333	0	0.927291667	191.1763333	4.831	200.1	No mining operations, Care and Maintenance
01/27/2020	-	-	-	-21	-22.85666667	-25.56	81.33416667	0.1	0.592458333	203.15	2.617	222.1	No mining operations, Care and Maintenance
01/28/2020	-	-	-	-7.618	-16.98991667	-25.55	86.28166667	0	1.289166667	248.06975	9.23	333.2	No mining operations, Care and Maintenance
01/30/2020	2.8	2.8	-	-7.641	-10.71583333	-15.43	91.95416667	0	1.056208333	287.1625	4.577	353.6	No mining operations, Care and Maintenance
01/31/2020	2.8	2.8	-	-11.95	-14.5725	-17.52	88.7875	0	0.659875	250.6625	3.459	168	No mining operations, Care and Maintenance
02/04/2020	-	-	-	-16.15	-21.4475	-26.76	82.92125	0	0.44875	229.1041667	2.93	200.7	No mining operations, Care and Maintenance
02/05/2020	-	-	-	-11.03	-13.79791667	-16.4	89.17916667	0	0.368875	213.8125	2.391	307.5	No mining operations, Care and Maintenance
02/06/2020	-	-	-	-7.323	-10.2525	-13.43	91.73333333	0	0.379666667	269.15125	2.058	218.5	No mining operations, Care and Maintenance
02/07/2020	-	-	-	-8.67	-10.62	-13.1	91.4125	0	0.218541667	156.4853333	2.45	208.7	No mining operations, Care and Maintenance
02/14/2020	-	-	-	-27.48	-31.72125	-34.24	71.61916667	0	1.068166667	201.5083333	3.989	205.8	No mining operations, Care and Maintenance
02/18/2020	-	-	-	-16.05	-21.94041667	-25.15	81.71708333	0	0.649958333	208.8875	4.763	205.3	No mining operations, Care and Maintenance
02/19/2020	-	-	-	-0.387	-3.29075	-15.28	69.50416667	0	4.209083333	316.05	17.01	321.2	No mining operations, Care and Maintenance

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Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
02/20/2020	-	-	-	-2.891	-5.195583333	-7.755	64.91666667	0	2.870833333	319.6133333	12.42	316.3	No mining operations, Care and Maintenance
02/21/2020	-	2.8	2.8	-2.066	-4.977041667	-8.2	73.76208333	0	1.379541667	217.785	9.66	324.5	No mining operations, Care and Maintenance
02/25/2020	2.8	2.8	2.8	-18.07	-21.80166667	-26.24	79.90833333	0	1.070541667	240.675	5.067	209.8	No mining operations, Care and Maintenance
02/26/2020	2.8	2.8	2.8	-14.71	-18.91916667	-22.63	84.3375	0.7	0.515291667	207.9791667	3.185	201	No mining operations, Care and Maintenance
02/27/2020	2.8	-	-	-13.77	-15.85125	-18.19	84.29833333	1.3	1.567041667	214.55	5.38	202	No mining operations, Care and Maintenance
03/03/2020	-	-	-	-14.16	-18.31375	-23.39	82.22166667	1	1.034041667	212.4583333	3.675	214.3	No mining operations, Care and Maintenance
03/10/2020	-	-	-	-8.22	-11.43208333	-16.65	83.60708333	0.1	1.652125	207.2458333	6.194	192.1	No mining operations, Care and Maintenance
03/12/2020	-	-	-	-15.32	-24.20708333	-29.28	65.74083333	0	1.359833333	209.8805417	3.695	350	No mining operations, Care and Maintenance
03/19/2020	-	-	-	0.597	-3.675791667	-7.041	74.09916667	0	0.9235	206.0408333	4.773	213.7	No mining operations, Care and Maintenance
03/24/2020	-	-	-	-1.314	-6.080375	-12.25	79.17083333	1.3	1.950083333	155.8077083	9.89	52.89	No mining operations, Care and Maintenance
03/25/2020	-	-	-	0.798	-2.537916667	-5.041	85.86166667	1.7	2.228291667	32.57966667	8.15	109.3	No mining operations, Care and Maintenance
03/26/2020	11.4	2.8	2.8	-4.863	-9.027541667	-14.48	68.26291667	0.1	2.898708333	157.7095833	9.4	331.5	No mining operations, Care and Maintenance
03/31/2020	-	-	10.6	-5.757	-15.91129167	-22.62	41.5125	0.3	1.399166667	224.11	3.979	163.4	No mining operations, Care and Maintenance
04/02/2020	-	-	-	-0.974	-9.887416667	-16.15	45.9575	0.5	1.562125	214.0245833	4.988	265.8	No mining operations, Care and Maintenance
04/03/2020	-	-	-	-2.224	-8.65375	-14.01	47.92375	0	1.590083333	220.1	4.665	198.7	No mining operations, Care and Maintenance
04/07/2020	-	-	-	-4.811	-10.58170833	-17.43	55.52958333	0.4	2.020333333	163.1907083	7.154	29.71	No mining operations, Care and Maintenance
04/10/2020	-	-	-	-0.38	-8.080916667	-15.31	46.02416667	0.7	1.903375	189.2947917	6.115	59.65	No mining operations, Care and Maintenance
04/16/2020	-	-	-	8.49	5.269166667	2.279	63.21833333	0.2	2.054833333	205.2249167	12.38	166.5	No mining operations, Care and Maintenance
04/21/2020	-	-	-	7	2.943833333	0.801	81.57708333	1.3	1.247083333	208.828625	5.615	302.1	No mining operations, Care and Maintenance
04/22/2020	-	-	-	4.123	1.223708333	-2.551	73.40458333	0.5	1.634125	169.7766667	8.18	77.49	No mining operations, Care and Maintenance
04/24/2020	-	2.8	2.8	-2.297	-5.00725	-8.07	58.16166667	0.2	2.864333333	174.075	9.15	148.6	No mining operations, Care and Maintenance
04/28/2020	-	2.8	-	5.954	1.568	-4.194	61.76833333	0.1	1.854291667	184.14375	6.635	64.19	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
04/29/2020	2.8	7.2	9.2	1.934	-0.397458333	-3.49	56.89375	0.4	2.189791667	236.1366667	7.918	258.3	No mining operations, Care and Maintenance
04/30/2020	2.8	-	-	-1.625	-5.063875	-8.14	80.01208333	0.5	2.35475	195.8791667	6.948	163	No mining operations, Care and Maintenance
05/05/2020	-	-	-	11.67	4.849708333	-0.784	66.34166667	0.8	1.633375	238.2458333	6.782	214.7	No mining operations, Care and Maintenance
05/06/2020	-	-	-	12.95	5.823791667	-0.895	54.36333333	0.5	1.417041667	232.4291667	5.106	233.7	No mining operations, Care and Maintenance
05/07/2020	-	-	-	12.96	7.012625	1.961	47.95791667	0	1.200541667	209.69875	5.067	209.8	No mining operations, Care and Maintenance
05/19/2020	-	-	-	10.63	4.087916667	-2.92	36.195	0	2.5845	248.1583333	7.526	261	No mining operations, Care and Maintenance
05/21/2020	-	-	-	15.4	8.486083333	0.058	46.08291667	0	1.559666667	205.4920417	5.762	7.979	No mining operations, Care and Maintenance
05/26/2020	-	-	-	13.2	9.020583333	6.395	64.88916667	2.3	1.421375	171.5091667	7.183	259.7	No mining operations, Care and Maintenance
05/27/2020	2.8	2.8	2.8	13.6	9.132208333	5.523	79.08875	1.6	0.999291667	168.2158333	7.468	140.6	No mining operations, Care and Maintenance
05/29/2020	2.8	2.8	2.8	19.12	14.3225	9.71	27.51	0	1.610791667	254.4833333	6.958	76.08	No mining operations, Care and Maintenance
06/11/2020	-	-	-	16.13	11.52991667	6.738	65.42708333	10.5	1.744291667	188.8279167	7.056	153.6	No mining operations, Care and Maintenance
06/17/2020	-	-	-	17.26	12.89166667	10.16	70.97375	0.7	1.6235	254.8325	7.487	331.7	No mining operations, Care and Maintenance
06/18/2020	-	-	-	20.3	14.21916667	8.66	63.90416667	0.7	1.095291667	256.6654167	7.703	257.6	No mining operations, Care and Maintenance
06/22/2020	-	-	-	11.68	8.739208333	6.459	83.67	0	2.185375	112.8005833	9.88	19.07	No mining operations, Care and Maintenance
06/23/2020	-	-	-	10.63	7.681083333	5.57	84.97291667	1	1.794583333	111.55225	7.458	348.9	No mining operations, Care and Maintenance
06/24/2020	-	-	-	11.8	7.445333333	5.332	89.58583333	6.3	1.481708333	60.48054167	6.713	8.96	No mining operations, Care and Maintenance
06/25/2020	2.8	2.8	-	13.94	8.420333333	3.679	76.12833333	2	1.378708333	132.3204167	9.99	121.7	No mining operations, Care and Maintenance
06/30/2020	2.8	2.8	-	15.5	10.97825	6.649	77.47958333	0.4	1.933625	188.1480833	8.39	139.6	No mining operations, Care and Maintenance
07/02/2020	-	-	-	15.89	9.632125	1.384	57.03833333	0.9	1.962875	190.35	6.723	34.36	No mining operations, Care and Maintenance
07/09/2020	-	-	-	16.53	11.51166667	8.09	76.0075	0	1.236166667	196.2525	6.546	36.73	No mining operations, Care and Maintenance
07/10/2020	-	-	-	16.58	11.19166667	7.925	84.16458333	0	0.943916667	207.4458333	5.449	20.9	No mining operations, Care and Maintenance
07/16/2020	-	-	-	20.82	13.49575	6.776	70.90333333	3.3	1.421791667	219.695	5.576	14.13	No mining operations, Care and Maintenance

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
07/22/2020	-	-	-	12.03	9.899291667	7.552	85.7675	5.3	1.607541667	240.2458333	5.625	87.4	No mining operations, Care and Maintenance
07/23/2020	-	-	-	16.22	9.930833333	5.661	73.44125	0.2	1.442	194.4804167	5.165	212.1	No mining operations, Care and Maintenance
07/28/2020	-	-	-	11.32	9.550333333	7.694	93.40833333	0.6	0.516416667	223.2900833	3.646	359.1	No mining operations, Care and Maintenance
07/29/2020	-	-	-	15.9	11.615	8.85	85.33708333	0	0.860458333	171.277125	5.312	153.2	No mining operations, Care and Maintenance
07/30/2020	-	22.9	16.2	22.92	14.57866667	6.921	71.01916667	0	1.611791667	269.35	6.39	157.7	No mining operations, Care and Maintenance
08/04/2020	-	-	-	18.74	11.866625	6.787	76.00083333	4.2	1.280125	233.6866667	4.949	199.2	Mining operations active
08/06/2020	-	-	-	15.95	10.98695833	6.458	75.3875	0.5	1.199541667	231.9166667	4.978	286.9	Mining operations active
08/10/2020	-	-	-	12.98	9.12128	4.893	85.4488	0.5	0.80776	201.2	5.096	204.6	Mining operations active
08/23/2020	-	-	-	18.48	13.18416667	10.53	76.37125	1.8	1.26375	202.1154167	5.9	235.1	Mining operations active
08/24/2020	-	-	-	14.06	11.49333333	9.1	85.56083333	6.6	0.875208333	234.9566667	4.204	13.69	Mining operations active
08/25/2020	-	-	-	12.62	10.68958333	9.34	93.18333333	17.3	0.427208333	261.3083333	2.734	267.5	Mining operations active
08/26/2020	-	2.8	5.6	12.89	9.890166667	7.491	89.02208333	13.4	0.740708333	241.2291667	3.93	287.1	Mining operations active
08/27/2020	-	6.8	6.5	14.05	9.001541667	4.255	78.86	0	1.08075	191.195	3.793	215.3	Mining operations active
08/28/2020	2.8	2.8	8.7	14.49	9.097708333	4.627	75.98291667	0	1.378625	228.9166667	4.91	219.5	Mining operations active
08/29/2020	9.3	-	-	15.4	9.761791667	5.197	73.61583333	0	1.311291667	178.0129167	6.056	225.1	Mining operations active
08/30/2020	2.8	-	-	10.86	8.845708333	7.022	74.19	0.1	1.404875	320.8397917	6.527	141.6	Mining operations active
09/02/2020	2.8	2.8	6.1	14.4	7.991875	4.123	81.83541667	0	1.169666667	256.417625	5.762	7.979	Mining operations active
09/04/2020	5.6	9.4	2.8	8.38	5.559375	3.885	94.66666667	6.5	0.61625	196.5055833	4.684	273.1	Mining operations active
09/06/2020	2.8	2.8	2.8	10.88	6.010583333	3.58	85.13458333	0.2	0.684291667	203.571625	5.439	10.13	Mining operations active
09/09/2020	-	-	-	11	6.139208333	1.932	77.56625	1.6	1.409333333	198.3554167	7.144	324.5	Mining operations active
09/10/2020	-	-	-	7.981	4.92925	2.3	86.01458333	2.6	1.157	203.9933333	8.06	178.2	Mining operations active
09/11/2020	-	-	-	4.295	2.180791667	0.149	78.56916667	0	1.609333333	207.2551667	7.193	41.58	Mining operations active
09/12/2020	-	-	-	6.649	2.350875	-0.358	79.64583333	1.4	0.911958333	249.4270833	5.762	7.979	Mining operations active
09/14/2020	-	-	-	8.55	3.162416667	-1.496	69.09625	0	1.394375	252.8107917	4.351	197.7	Mining operations active
09/24/2020	-	-	-	8.06	6.161333333	4.084	82.84125	0.2	1.189583333	216.25	5.694	295.3	Mining operations active
10/06/2020	11.2	2.8	2.8	3.111	2.19375	1.089	97.20833333	4.8	0.570666667	196.1082917	2.744	327.3	Mining operations active
10/07/2020	2.8	2.8	6.0	2.4	0.715958333	0.047	98.0125	0.4	0.345	172.4083333	3.067	189.8	Mining operations active
10/08/2020	2.8	2.8	2.8	1.602	0.032625	-1.014	97.24583333	3.4	0.240458333	93.94166667	3.783	206.2	Mining operations active
10/13/2020	-	-	-	-6.458	-8.996416667	-11.48	82.91	0	1.310833333	211.9958333	3.949	220.7	Mining operations active
10/15/2020	-	-	-	-5.877	-7.304625	-9.13	92.14583333	0	0.73875	204.175	3.273	210	Mining operations active
10/16/2020	-	-	-	-6.125	-10.82483333	-16.96	76.59916667	0	1.72975	191.8985833	6.576	118.9	Mining operations active
10/19/2020	-	-	-	-10.26	-14.96375	-17.78	83.315	0	1.089333333	235.8685417	2.852	223.8	Mining operations active
10/20/2020	-	-	-	-11.48	-15.20208333	-18.07	85.24291667	2.626	0.997916667	229.3541667	3.842	208.9	Mining operations active
10/23/2020	-	-	-	-12.8	-16.28041667	-18.46	85.51666667	0	0.886083333	249.9833333	3.273	210	Mining operations active
10/24/2020	-	-	-	-10.84	-14.82958333	-18.5	85.44958333	0	0.571958333	228.9208333	2.548	193.4	Mining operations active
10/25/2020	-	-	-	-8.89	-11.9	-13.44	87.2025	0	0.716875	247.3942917	3.077	340.7	Mining operations active
11/01/2020	-	-	-	-22.39	-23.96333333	-25.59	80.92291667	0	0.715833333	211.39	5.851	15.52	Mining operations active
11/22/2020	-	-	-	-10.01	-11.56708333	-14.95	91.5625	0.584	0.351875	261.70175	2.813	215.2	Mining operations active

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24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
11/23/2020	-	-	-	-9.03	-11.13458333	-13.79	91.49166667	0	0.759	217.83575	4.116	279.9	Mining operations active
11/24/2020	-	-	-	-9.04	-10.49083333	-13.27	92.04166667	1.168	0.287458333	283.4985	2.734	267.5	Mining operations active
11/25/2020	-	-	-	-14.19	-16.06833333	-17.59	87.89583333	0	0.616333333	249.6845833	2.813	215.2	Mining operations active
11/30/2020	-	2.8	-	-6.436	-9.222416667	-11.14	87.78166667	0	0.978333333	265.8970833	6.684	120.4	Mining operations active
12/07/2020	2.8	2.8	-	-1.728	-4.406875	-8.37	94.275	0	0.734708333	168.2958333	4.165	176	Mining operations active
12/08/2020	2.8	-	-	-0.613	-1.713611111	-5.824	79.33277778	0	0.732611111	229.3290556	5.664	212.4	Mining operations active
01/01/2021	-	2.8	2.8	-12.43	-16.36625	-21.99	86.35	0	0.910208333	270.2958333	2.979	217.7	Mining operations active
01/02/2021	-	2.8	2.8	-18.83	-20.40291667	-23.35	84.09166667	0	0.363666667	234.2916667	2.068	124.2	Mining operations active
01/03/2021	-	2.8	-	-19.05	-21.69208333	-23.48	82.99583333	0	0.322166667	200.4625	2.195	229.1	Mining operations active
01/04/2021	-	-	-	-17.37	-20.52958333	-23.05	84.19583333	0	0.342875	191.5566667	3.303	210.3	Mining operations active
01/07/2021	-	-	2.8	-5.327	-8.148958333	-9.93	85.21416667	0	0.823791667	233.62975	4.038	188.6	Mining operations active
01/08/2021	-	-	-	-1.061	-3.997041667	-6.979	72.82958333	0	1.804208333	216.841375	9.77	334.3	Mining operations active
01/11/2021	-	-	-	0.482	-1.243958333	-3.992	66.08625	0	2.690041667	271.094625	11.6	327.9	Mining operations active
01/14/2021	-	-	-	-8.42	-13.64833333	-16.5	87.91333333	0	0.933416667	229.5083333	4.371	183.3	Mining operations active
01/16/2021	-	-	-	-6.59	-9.610583333	-11.49	92.7	0	0.793666667	255.0416667	3.822	195.7	Mining operations active
01/17/2021	-	-	-	-6.731	-8.3555	-11.77	91.80833333	0	0.692	259.5458333	4.057	209.1	Mining operations active
02/04/2021	-	2.8	2.8	-24.52	-26.12291667	-27.2	78.20666667	0	0.432958333	214.5182917	3.724	349.3	Mining operations active
02/05/2021	-	2.8	6.9	-26.72	-28.69291667	-30.84	75.42333333	0	0.558125	224.5966667	3.616	298	Mining operations active
02/06/2021	-	2.8	6.2	-29.15	-31.81916667	-33.46	72.09375	0	0.446666667	248.5816667	2.489	353.3	Mining operations active
02/12/2021	-	-	-	-14.34	-19.44333333	-22.38	81.20541667	0	0.417458333	213.1729583	2.499	189.1	Mining operations active
02/15/2021	-	-	-	-17.67	-21.82833333	-24.03	74.8075	0	0.635583333	251.6720833	3.312	323.4	Mining operations active
02/16/2021	-	-	-	-20.14	-22.67875	-25.23	79.16791667	0	0.60975	190.992875	3.283	1.998	Mining operations active
02/17/2021	-	-	-	-16.9	-19.84083333	-22.26	82.97	0	0.647166667	216.0125	5.517	349.3	Mining operations active
03/03/2021	-	-	-	-9.43	-11.93916667	-13.93	86.1375	0	1.259375	201.8875	3.93	287.1	Mining operations active
03/05/2021	-	-	-	-4.394	-9.061708333	-12.62	87.46208333	0	0.651333333	235.2166667	3.479	205.9	Mining operations active
03/06/2021	-	-	-	-5.187	-7.8115	-11.14	77.0925	0	1.352541667	234.2329167	6.517	288	Mining operations active
03/07/2021	-	-	-	-7.079	-13.07091667	-18.14	75.09666667	0	1.476041667	218.5577917	5.145	337.5	Mining operations active
03/09/2021	-	-	-	-7.436	-13.82158333	-18.41	74.09416667	0	1.060916667	236.7158333	3.371	199.3	Mining operations active
03/10/2021	-	-	-	-8.62	-13.02125	-16	75.98125	0	0.917583333	235.2708333	4.381	211.6	Mining operations active
03/15/2021	-	2.8	5.7	-12.66	-21.1025	-26.48	67.41666667	0	1.353541667	226.2125	4.204	13.69	Mining operations active
03/18/2021	-	2.8	2.8	-7.427	-10.29358333	-17.56	82.41125	0	1.348708333	171.2874583	5.998	132.8	Mining operations active
03/19/2021	-	2.8	2.8	-10.76	-15.15625	-19.09	69.49625	0	2.764125	194.1125	6.38	304.5	Mining operations active
04/01/2021	-	2.8	5.8	-4.07	-8.799958333	-13.61	61.50041667	0	3.202708333	234.7875	9.56	269.3	Mining operations active
04/02/2021	-	2.8	2.8	-6.366	-13.44316667	-20.16	54.64958333	0	1.759208333	182.8083333	7.213	51.31	Mining operations active
04/03/2021	-	5.8	2.8	-2.949	-7.686916667	-11.95	71.05	0	1.71925	188.7717083	7.585	333.1	Mining operations active
04/05/2021	-	-	-	-3.172	-7.024458333	-15.12	66.96291667	0	2.80825	128.7345833	10.01	331.2	Mining operations active
04/15/2021	-	-	-	7.863	3.07275	-2.574	48.36125	0	1.777333333	216.4666667	7.046	127	Mining operations active
04/16/2021	-	-	-	9.38	2.783625	-2.562	48.29916667	0	1.593458333	198.875	5.998	132.8	Mining operations active
04/17/2021	-	-	-	8.54	2.294666667	-4.559	43.62583333	0	2.024333333	206.8416667	5.39	206.2	Mining operations active
04/18/2021	-	-	-	13	3.448166667	-3.432	38.82666667	0	1.593333333	227.4999583	4.596	200.2	Mining operations active
04/20/2021	-	-	-	9.54	3.1645	-4.876	53.98166667	0	2.984041667	167.2214583	12.39	127.8	Mining operations active
05/03/2021	-	-	-	9.21	5.270833333	0.954	43.52666667	0	1.767125	269.827	6.713	8.96	Mining operations active
05/04/2021	-	-	-	8.61	5.35575	1.449	56.19625	0	1.47175	216.8411667	6.409	32	Mining operations active

* Starting October 15, 2013, total precipitation is reported rather than total rain

Note: - indicates no data recorded; n/a = not applicable/not available

ATTACHMENT A1

24-HOUR AVERAGE TOTAL PARTICULATES RESULTS, METEOROLOGICAL CONDITIONS, AND SITE ACTIVITIES, AUG. 2012 – DEC. 2021

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Activities at site
05/06/2021	-	-	-	11.06	7.244416667	2.91	45.26041667	0	2.106666667	262.30875	8.15	109.3	Mining operations active
05/10/2021	-	-	-	13.28	6.86575	1.255	52.19541667	0	1.435166667	204.708375	8.32	326.2	Mining operations active
05/13/2021	-	-	-	9.17	5.130541667	0.313	71.19291667	0	1.426458333	184.1409583	7.409	51.11	Mining operations active
05/14/2021	-	-	-	6.919	3.953875	0.87	82.59291667	0	1.635541667	191.3404167	6.899	88.2	Mining operations active
05/15/2021	-	-	-	8.02	3.590083333	-0.615	76.75208333	0	1.313333333	207.4295833	6.468	257.7	Mining operations active
05/17/2021	-	-	-	11.07	5.636541667	-0.592	58.87625	0	2.135541667	206.6083333	7.007	267.8	Mining operations active
05/19/2021	-	-	-	12.63	6.409958333	0.21	54.2	0	1.410708333	186.8675833	5.988	259.7	Mining operations active
06/01/2021	-	2.8	2.8	14.69	10.45616667	7.703	77.78333333	0	1.692625	182.9022917	9.62	167.8	Mining operations active
06/02/2021	-	2.8	2.8	15.93	10.53208333	5.388	68.58541667	0	2.141958333	265.3041667	9.73	349.8	Mining operations active
06/07/2021	-	11.5	2.8	14.43	9.912125	4.701	50.91833333	0	2.312208333	158.6666667	8.17	322.8	Mining operations active
06/09/2021	-	-	-	21.26	15.20091667	7.652	36.31583333	0	2.271708333	263.8208333	11.05	333.3	Mining operations active
06/10/2021	-	-	-	21.5	14.73273913	6.18	32.65565217	0	1.670608696	190.1269565	14.31	273.9	Mining operations active
06/14/2021	-	-	-	20.57	14.45833333	7.63	39.41375	0	1.821125	198.52	7.242	200.7	Mining operations active
06/18/2021	-	-	-	22.59	15.85666667	10.6	48.31583333	0	1.810666667	215.5454167	9.06	153.2	Mining operations active
06/22/2021	-	-	-	21.03	14.54083333	8.74	55.42708333	0.2	1.754916667	176.8520833	5.841	64.4	Mining operations active
06/28/2021	-	-	-	24.37	18.31208333	11.34	49.5725	0	1.630708333	217.3239583	9.67	111.9	Mining operations active
10/14/2021	-	2.8	2.8	-1.459	-2.0475	-2.526	97.17	0	0.6191	273.46	2.871	278	Mining operations active
10/15/2021	-	2.8	2.8	-0.911	-2.963583333	-6.007	97.05416667	0	0.171333333	84.59166667	2.891	213.8	Mining operations active
10/16/2021	-	2.8	2.8	-3.035	-4.296791667	-5.335	95.02916667	0	0.563958333	219.7375	2.509	178.2	Mining operations active
10/17/2021	-	2.8	2.8	-3.604	-6.854625	-10.89	96.18333333	0	1.018166667	268.6208333	3.528	284.8	Mining operations active
12/01/2021	-	2.8	8.7	-15.88	-18.30041667	-20.18	85.9125	0	0.357791667	221.125	2.274	234.4	Mining operations active
12/07/2021	-	2.8	6.1	-14.32	-17.95083333	-22.42	86.00833333	0	0.340541667	191.2258333	2.901	219.5	Mining operations active
12/08/2021	-	2.8	-	-14.14	-17.10375	-20.21	86.83333333	0	0.382375	278.4592083	2.577	340.9	Mining operations active
12/09/2021	-	2.8	6.7	-18.29	-20.43166667	-23.75	83.9125	0	0.183666667	256.1495833	2.499	205.7	Mining operations active
12/10/2021	-	2.8	2.8	-14.02	-16.70916667	-21.17	87.17916667	0	0.056416667	139.4325	2.313	214.3	Mining operations active
12/12/2021	-	2.8	9.9	-19.6	-22.12916667	-24.48	81.65208333	0	0.9025	97.45	5.351	205.6	Mining operations active
12/27/2021	-	2.8	7.1	-19.31	-23.23458333	-26.39	81.14875	0	0.356916667	211.7087917	4.136	224.5	Mining operations active
12/28/2021	-	2.8	6.2	-19.6	-21.02083333	-21.8	83.07083333	0	0.355083333	250.1338333	2.822	303	Mining operations active
12/30/2021	-	2.8	2.8	-14.08	-17.7425	-22.61	86.00833333	3	0	0	0	0	Mining operations active
12/31/2021	-	8.7	2.8	-22.22	-24.08083333	-25.87	80.37083333	0	0	0	0	0	Mining operations active

* Starting October 15, 2013, total precipitation is reported rather than total rain

Note: - indicates no data recorded; n/a = not applicable/not available

ATTACHMENT A2

AVERAGE PM_{10} AND $PM_{2.5}$ RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
17-Aug-2015	-	2.8	-	2.8	-	2.8
18-Aug-2015	-	6.5	-	6.5	-	2.8
20-Aug-2015	-	6.5	-	6.5	-	2.8
22-Aug-2015	2.8	-	2.8	-	2.8	-
23-Aug-2015	7.8	-	7.8	-	2.8	-
24-Aug-2015	14.6	-	14.6	-	5.8	-
05-Sep-2015	2.8	-	2.8	-	2.8	-
06-Sep-2015	2.8	-	2.8	-	2.8	-
09-Sep-2015	2.8	-	2.8	-	2.8	-
11-Sep-2015	-	2.8	-	2.8	-	2.8
12-Sep-2015	-	-	-	-	-	2.8
14-Sep-2015	-	-	-	-	-	2.8
20-Nov-2015	-	2.8	-	2.8	-	-
21-Nov-2015	-	2.8	-	2.8	-	-
24-Nov-2015	-	2.8	-	2.8	-	-
25-Nov-2015	2.8	-	2.8	-	2.8	-
09-Jan-2016	-	2.8	-	2.8	-	2.8
10-Jan-2016	-	2.8	-	2.8	-	6.2
16-Jan-2016	-	2.8	-	2.8	-	2.8
17-Jan-2016	2.8	-	2.8	-	2.8	-
18-Jan-2016	2.8	-	2.8	-	2.8	-
19-Jan-2016	2.8	-	2.8	-	2.8	-
13-Feb-2016	2.8	-	2.8	-	6.4	-
14-Feb-2016	2.8	-	2.8	-	2.8	-
15-Feb-2016	2.8	-	2.8	-	2.8	-
22-Feb-2016	-	2.8	-	2.8	-	2.8
23-Feb-2016	-	2.8	-	2.8	-	2.8
25-Feb-2016	-	2.8	-	2.8	-	2.8
17-Mar-2016	2.8	-	2.8	-	2.8	-
18-Mar-2016	2.8	-	2.8	-	2.8	-
19-Mar-2016	2.8	-	2.8	-	2.8	-
21-Mar-2016	-	2.8	-	2.8	-	2.8
23-Mar-2016	-	2.8	-	2.8	-	2.8
28-Mar-2016	-	2.8	-	2.8	-	2.8
15-Apr-2016	-	2.8	-	2.8	-	2.8
16-Apr-2016	-	2.8	-	2.8	-	2.8
18-Apr-2016	-	2.8	-	2.8	-	2.8
25-Apr-2016	2.8	-	2.8	-	2.8	-
26-Apr-2016	2.8	-	2.8	-	2.8	-
29-Apr-2016	2.8	-	2.8	-	8.2	-
15-May-2016	2.8	-	2.8	-	2.8	-
16-May-2016	2.8	-	2.8	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
18-May-2016	2.8	-	2.8	-	2.8	-
19-May-2016	-	2.8	-	2.8	-	2.8
21-May-2016	-	2.8	-	2.8	-	2.8
22-May-2016	-	2.8	-	2.8	-	2.8
20-Jun-2016	2.8	-	2.8	-	2.8	-
22-Jun-2016	2.8	-	2.8	-	2.8	-
26-Jun-2016	2.8	-	2.8	-	2.8	-
27-Jun-2016	-	5.6	-	5.6	-	2.8
29-Jun-2016	-	13.8	-	13.8	-	13.6
15-Jul-2016	-	17.4	-	17.4	-	12.1
17-Jul-2016	-	10.1	-	10.1	-	12.2
18-Jul-2016	-	2.8	-	2.8	-	2.8
25-Jul-2016	2.8	-	2.8	-	2.8	-
26-Jul-2016	2.8	-	2.8	-	2.8	-
27-Jul-2016	2.8	-	2.8	-	2.8	-
13-Aug-2016	2.8	-	2.8	-	2.8	-
14-Aug-2016	2.8	-	2.8	-	2.8	-
15-Aug-2016	2.8	-	2.8	-	2.8	-
30-Aug-2016	-	2.8	-	2.8	-	9.0
31-Aug-2016	-	2.8	-	2.8	-	2.8
12-Sep-2016	-	2.8	-	2.8	-	2.8
14-Sep-2016	-	2.8	-	2.8	-	2.8
21-Sep-2016	-	2.8	-	2.8	-	2.8
23-Sep-2016	2.8	-	2.8	-	2.8	-
24-Sep-2016	2.8	-	2.8	-	2.8	-
25-Sep-2016	2.8	-	2.8	-	2.8	-
03-Oct-2016	-	-	-	-	2.8	-
23-Oct-2016	-	2.8	-	2.8	-	2.8
27-Oct-2016	-	2.8	-	2.8	-	2.8
28-Oct-2016	-	2.8	-	2.8	-	2.8
29-Oct-2016	2.8	-	2.8	-	2.8	-
30-Oct-2016	2.8	-	2.8	-		-
31-Oct-2016	2.8	-	2.8	-	2.8	-
04-Nov-2016	2.8	-	2.8	-	2.8	-
05-Nov-2016	2.8	-	2.8	-	2.8	-
25-Nov-2016	2.8	-	2.8	-	2.8	-
30-Nov-2016	-	6.0	-	6.0	-	2.8
01-Dec-2016	-	2.8	-	2.8	-	2.8
02-Dec-2016	-	2.8	-	2.8	-	2.8
18-Dec-2016	-	2.8	-	2.8	-	10.0
20-Dec-2016	-	8.3	-	8.3	-	6.2
21-Dec-2016	-	2.8	-	2.8	-	2.8

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
31-Dec-2016	2.8	-	2.8	-	2.8	-
01-Jan-2017	2.8	-	2.8	-	2.8	-
02-Jan-2017	2.8	-	2.8	-	2.8	-
15-Jan-2017	11.0	-	11.0	-	11.4	-
19-Jan-2017	6.1	-	6.1	-	11.0	-
23-Jan-2017	5.8	-	5.8	-	11.8	-
25-Jan-2017	-	6.4	-	6.4	-	5.7
26-Jan-2017	-	2.8	-	2.8	-	6.2
27-Jan-2017	-	8.2	-	8.2	-	7.2
20-Feb-2017	2.8	-	2.8	-		-
22-Feb-2017	2.8	-	2.8	-	2.8	-
23-Feb-2017	2.8	-	2.8	-	2.8	-
24-Feb-2017	-	2.8	-	2.8	2.8	-
25-Feb-2017	-	2.8	-	2.8	-	2.8
26-Feb-2017	-	2.8	-	2.8	-	2.8
17-Mar-2017	-	6.2	-	6.2	-	-
18-Mar-2017	-	2.8	-	2.8	-	-
19-Mar-2017	-	2.8	-	2.8	-	-
21-Mar-2017	2.8	-	2.8	-	-	-
22-Mar-2017	2.8	-	2.8	-	-	-
23-Mar-2017	2.8	-	2.8	-	-	-
21-Apr-2017	2.8	-	2.8	-	-	-
23-Apr-2017	2.8	-	2.8	-	-	-
24-Apr-2017	2.8	-	2.8	-	-	-
25-Apr-2017	-	2.8	-	2.8	-	-
28-Apr-2017	-	6.0	-	6.0	-	-
29-Apr-2017	-	2.8	-	2.8	-	-
12-May-2017	-	2.8	-	2.8	-	-
17-May-2017	-	2.8	-	2.8	-	-
18-May-2017	-	2.8	-	2.8	-	-
19-May-2017	2.8	-	2.8	-	-	-
23-May-2017	2.8	-	2.8	-	-	-
24-May-2017	2.8	-	2.8	-	-	-
02-Jun-2017	-	2.8	-	2.8	-	-
06-Jun-2017	-	2.8	-	2.8	-	-
07-Jun-2017	-	2.8	-	2.8	-	-
08-Jun-2017	-	-	-	-	-	-
09-Jun-2017	-	-	-	-	-	2.8
13-Jun-2017	-	-	-	-	-	2.8
14-Jun-2017	2.8	-	2.8	-	-	2.8
15-Jun-2017	6.2	-	6.2	-	-	-
16-Jun-2017	14.2	-	14.2	-	-	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
20-Jun-2017	-	-	-	-	-	-
23-Jun-2017	-	-	-	-	7.9	-
27-Jun-2017	-	-	-	-	6.2	-
28-Jun-2017	-	-	-	-	2.8	-
04-Jul-2017	2.8	-	2.8	-	6.0	-
05-Jul-2017	6.1	-	6.1	-	5.6	-
07-Jul-2017	2.8	-	2.8	-	2.8	-
11-Jul-2017	-	2.8	-	2.8	-	2.8
12-Jul-2017	-	2.8	-	2.8	-	7.9
14-Jul-2017	-	7.9	-	7.9	-	-
09-Aug-2017	13.9	-	13.9	-	11.1	-
11-Aug-2017	15.1	-	15.1	-	9.6	-
15-Aug-2017	6.7	-	6.7	-	2.8	-
16-Aug-2017	-	2.8	-	2.8	-	2.8
22-Aug-2017	-	2.8	-	2.8	-	2.8
23-Aug-2017	-	2.8	-	2.8	-	2.8
01-Sep-2017	-	2.8	-	2.8	-	8.5
05-Sep-2017	-	5.7	-	5.7	-	8.3
06-Sep-2017	-	2.8	-	2.8	-	8.7
08-Sep-2017	9.2	-	9.2	-	6.9	-
15-Sep-2017	-	-	-	-	2.8	-
16-Sep-2017	7.8	-	7.8	-	-	-
19-Sep-2017	9.2	-	9.2	-	5.8	-
10-Oct-2017	2.8	-	2.8	-	2.8	-
12-Oct-2017	2.8	-	2.8	-	2.8	-
13-Oct-2017	2.8	-	2.8	-	2.8	-
18-Oct-2017	-	-	-	-	-	2.8
19-Oct-2017	-	2.8	-	2.8	-	-
24-Oct-2017	-	2.8	-	2.8	-	2.8
26-Oct-2017	-	-	-	-	-	2.8
02-Nov-2017	-	-	-	-	7.2	-
14-Nov-2017	-	-	-	-	2.8	-
16-Nov-2017	-	-	-	-	2.8	-
17-Nov-2017	-	-	-	-	-	2.8
23-Nov-2017	-	2.8	-	2.8	-	-
24-Nov-2017	-	-	-	-	-	8.3
28-Nov-2017	-	5.6	-	5.6	-	7.1
30-Nov-2017	-	7.5	-	7.5	-	-
05-Dec-2017	-	2.8	-	2.8	-	-
07-Dec-2017	-	2.8	-	2.8	-	-
12-Dec-2017	-	6.5	-	6.5	-	-
13-Dec-2017	-	-	-	-	-	2.8

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
15-Dec-2017	-	-	-	-	-	7.1
19-Dec-2017	-	-	-	-	-	6.5
20-Dec-2017	2.8	-	2.8	-	2.8	-
24-Dec-2017	-	-	-	-	8.9	-
28-Dec-2017	-	-	-	-	6.5	-
29-Dec-2017	2.8	-	2.8	-		-
02-Jan-2018	2.8	-	2.8	-	11.2	-
03-Jan-2018	2.8	-	2.8	-	2.8	-
04-Jan-2018	2.8	-	2.8	-	2.8	-
11-Jan-2018	-	2.8	-	2.8	-	5.6
18-Jan-2018	-	2.8	-	2.8	-	2.8
23-Jan-2018	-	2.8	-	2.8	-	2.8
31-Jan-2018	-	-	-	-	-	-
14-Feb-2018	-	-	-	-	-	-
15-Feb-2018	2.8	-	2.8	-	2.8	-
20-Feb-2018	2.8	-	2.8	-	2.8	-
21-Feb-2018	2.8	-	2.8	-	2.8	-
22-Feb-2018	-	2.8	-	2.8	-	10.1
23-Feb-2018	-	2.8	-	2.8	-	2.8
27-Feb-2018	-	2.8	-	2.8	-	12.4
01-Mar-2018	-	2.8	-	2.8	-	2.8
02-Mar-2018	-	2.8	-	2.8	-	2.8
06-Mar-2018	-	2.8	-	2.8	-	2.8
08-Mar-2018	2.8	-	2.8	-	6.0	-
13-Mar-2018	2.8	-	2.8	-	2.8	-
15-Mar-2018	2.8	-	2.8	-	2.8	-
10-Apr-2018	-	-	-	-	2.8	-
11-Apr-2018	-	-	-	-	2.8	-
12-Apr-2018	2.8	-	2.8	-	2.8	-
17-Apr-2018	2.8	-	2.8	-	-	2.8
19-Apr-2018	2.8	-	2.8	-	-	2.8
20-Apr-2018	-	6.2	-	6.2	-	-
24-Apr-2018	-	2.8	-	2.8	-	-
26-Apr-2018	-	2.8	-	2.8	-	2.8
01-May-2018	-	5.7	-	5.7	-	2.8
03-May-2018	-	2.8	-	2.8	-	2.8
08-May-2018	-	2.8	-	2.8	-	2.8
09-May-2018	6.4		6.4		-	-
10-May-2018	-	-	-	-	7.1	-
15-May-2018	2.8	-	2.8	-	6.8	-
22-May-2018	5.7	-	5.7	-	2.8	-
11-Jun-2018	2.8	-	2.8	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
13-Jun-2018	2.8	-	2.8	-	2.8	-
14-Jun-2018	-	-	-	-	2.8	-
19-Jun-2018	7.9	-	7.9	-	-	6.1
20-Jun-2018	-	2.8	-	2.8	-	10.1
21-Jun-2018	-	-	-	-	-	2.8
26-Jun-2018	-	7.2	-	7.2	-	-
03-Jul-2018	-	2.8	-	2.8	-	2.8
04-Jul-2018	-	2.8	-	2.8	-	2.8
06-Jul-2018	-	2.8	-	2.8	-	2.8
10-Jul-2018	2.8	-	2.8	-	2.8	-
11-Jul-2018	2.8	-	2.8	-	2.8	-
12-Jul-2018	2.8	-	2.8	-	2.8	-
13-Jul-2018	-	-	-	-	2.8	-
17-Jul-2018	-	-	-	-	-	-
18-Jul-2018	-	-	-	-	-	-
24-Jul-2018	-	2.8	-	2.8	-	-
26-Jul-2018	-	2.8	-	2.8	-	-
27-Jul-2018	-	2.8	-	2.8	-	-
01-Aug-2018	-	2.8	-	2.8	-	-
02-Aug-2018	-	-	-	-	-	2.8
04-Aug-2018	2.8	-	2.8	-	2.8	-
06-Aug-2018	-	-	-	-	2.8	-
07-Aug-2018	2.8	-	2.8	-	2.8	-
08-Aug-2018	-	-	-	-	-	2.8
17-Aug-2018	2.8	-	2.8	-	-	2.8
21-Aug-2018	-	2.8	-	2.8	-	-
22-Aug-2018	-	2.8	-	2.8	-	-
06-Sep-2018	2.8	-	2.8	-	2.8	-
07-Sep-2018	2.8	-	2.8	-	2.8	-
09-Sep-2018	2.8	-	2.8	-	2.8	-
10-Sep-2018	-	2.8	-	2.8	-	8.5
11-Sep-2018	-	2.8	-	2.8	-	2.8
12-Sep-2018	-	2.8	-	2.8	-	6.8
02-Oct-2018	-	-	-	-	-	7.1
03-Oct-2018	-	15.1	-	15.1	-	6.7
05-Oct-2018	-	15.4	-	15.4	-	10.1
07-Oct-2018	-	14.2	-	14.2	2.8	-
08-Oct-2018	16.4	-	16.4	-	10.1	-
24-Oct-2018	2.8	-	2.8	-	2.8	-
25-Oct-2018	2.8	-	2.8	-	-	-
16-Nov-2018	-	-	-	-	8.9	-
18-Nov-2018	-	-	-	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
19-Nov-2018	2.8	-	2.8	-	2.8	-
21-Nov-2018	2.8	-	2.8	-	-	2.8
22-Nov-2018	2.8	-	2.8	-	-	2.8
23-Nov-2018	-	2.8	-	2.8	-	5.8
28-Nov-2018	-	2.8	-	2.8	-	-
30-Nov-2018	-	2.8	-	2.8	-	-
04-Dec-2018	-	2.8	-	2.8	-	2.8
06-Dec-2018	-	-	-	-	-	2.8
07-Dec-2018	-	2.8	-	2.8	-	-
10-Dec-2018	-	2.8	-	2.8	-	2.8
12-Dec-2018	-	2.8	-	2.8	-	-
12-Dec-2018	6.7	-	6.7	-	-	-
13-Dec-2018	2.8	-	2.8	-	9.0	-
14-Dec-2018	2.8	-	2.8	-	8.2	-
26-Dec-2018	7.2	-	7.2	-	6.1	-
22-Jan-2019	2.8	-	2.8	-	6.0	-
24-Jan-2019	5.8	-	5.8	-	2.8	-
25-Jan-2019	2.8	-	2.8	-	6.1	-
29-Jan-2019	-	2.8	-	2.8	-	2.8
30-Jan-2019	-	2.8	-	2.8	-	8.2
31-Jan-2019	-	2.8	-	2.8	-	2.8
07-Feb-2019	-	2.8	-	2.8	-	2.8
08-Feb-2019	-	2.8	-	2.8	-	2.8
21-Feb-2019	-	5.7	-	5.7	-	2.8
22-Feb-2019	2.8	-	2.8	-	6.5	-
23-Feb-2019	2.8	-	2.8	-	2.8	-
25-Feb-2019	7.6	-	7.6	-	6.8	-
26-Feb-2019	-	-	-	-	-	-
27-Feb-2019	-	-	-	-	-	-
28-Feb-2019	-	-	-	-	-	-
09-Mar-2019	-	-	-	-	8.3	-
12-Mar-2019	-	-	-	-	2.8	-
13-Mar-2019	-	-	-	-	2.8	-
14-Mar-2019	2.8	-	2.8	-	-	2.8
19-Mar-2019	2.8	-	2.8	-	-	7.4
27-Mar-2019	2.8	-	2.8	-	-	6.2
02-Apr-2019	-	2.8	-	2.8	-	2.8
04-Apr-2019	-	2.8	-	2.8	-	2.8
09-Apr-2019	-	7.1	-	7.1	-	-
10-Apr-2019	-	-	-	-	-	2.8
11-Apr-2019	2.8	-	2.8	-	11.2	-
16-Apr-2019	-	-	-	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
17-Apr-2019	2.8	-	2.8	-	-	-
18-Apr-2019	2.8	-	2.8	-	-	-
19-Apr-2019	-	-	-	-	2.8	-
20-Apr-2019	-	-	-	-	-	-
10-May-2019	-	-	-	-	2.8	-
14-May-2019	-	-	-	-	2.8	-
18-May-2019	2.8	-	2.8	-	2.8	-
21-May-2019	12.5	-	12.5	-	-	21.2
23-May-2019	19.7	-	19.7	-	-	2.8
28-May-2019	-	-	-	-	-	2.8
04-Jun-2019	-	2.8	-	2.8	-	2.8
06-Jun-2019	-	2.8	-	2.8	-	2.8
18-Jun-2019	-	2.8	-	2.8	-	2.8
20-Jun-2019	2.8	-	2.8	-	2.8	-
25-Jun-2019	5.6	-	5.6	-	22.5	-
28-Jun-2019	2.8	-	2.8	-	10.6	-
29-Jun-2019	-	-	-	-	-	-
03-Jul-2019	-	7.4	-	7.4	-	10.0
04-Jul-2019	-	2.8	-	2.8	-	-
05-Jul-2019	-	-	-	-	-	2.8
09-Jul-2019	-	28.2 Y	-	28.2 Y	-	14.0
11-Jul-2019	36.2	-	36.2	-	-	11.9
16-Jul-2019	9.3	-	9.3	-	-	-
17-Jul-2019	-	-	-	-	-	6.1
18-Jul-2019	-	-	-	-	-	8.1
19-Jul-2019	36.5	-	36.5	-	-	-
21-Jul-2019	13.1	-	13.1	-	-	-
01-Aug-2019	-	2.8	-	2.8	-	2.8
06-Aug-2019	-	2.8	-	2.8	-	2.8
08-Aug-2019	-	2.8	-	2.8	-	-
13-Aug-2019	-	-	-	-	-	2.8
15-Aug-2019	2.8	-	2.8	-	2.8	-
16-Aug-2019	2.8	-	2.8	-	2.8	-
21-Aug-2019	2.8	-	2.8	-	2.8	-
22-Aug-2019	-	-	-	-	-	-
27-Aug-2019	-	-	-	-	-	-
03-Sep-2019	-	6.4	-	6.4	-	5.8
04-Sep-2019	-	2.8	-	2.8	-	2.8
05-Sep-2019	-	5.8	-	5.8	-	-
06-Sep-2019	-	-	-	-	-	2.8
10-Sep-2019	46.0	-	46.0	-	18.6	-
12-Sep-2019	2.8	-	2.8	-	16.9	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
17-Sep-2019	6.1	-	6.1	-	2.8	-
02-Oct-2019	-	2.8	-	2.8	-	-
03-Oct-2019	-	6.8	-	6.8	-	6.0
11-Oct-2019	-	2.8	-	2.8	-	2.8
15-Oct-2019	2.8	-	2.8	-	-	2.8
17-Oct-2019	2.8	-	2.8	-	2.8	-
22-Oct-2019	11.7	-	11.7	-	11.9	-
23-Oct-2019	-	-	-	-	2.8	-
06-Nov-2019	-	2.8	-	2.8	-	2.8
07-Nov-2019	-	2.8	-	2.8	-	2.8
12-Nov-2019	-	2.8	-	2.8	-	2.8
14-Nov-2019	2.8	-	2.8	-	2.8	-
19-Nov-2019	10.7	-	10.7	-	2.8	-
20-Nov-2019	11.2	-	11.2	-	-	-
21-Nov-2019	-	-	-	-	2.8	-
26-Nov-2019	-	-	-	-	2.8	-
03-Dec-2019	-	2.8	-	2.8	-	2.8
10-Dec-2019	-	2.8	-	2.8	-	2.8
12-Dec-2019	-	2.8	-	2.8	-	2.8
13-Dec-2019	2.8	-	2.8	-	6.9	-
18-Dec-2019	2.8	-	2.8	-	7.6	-
19-Dec-2019	2.8	-	2.8	-	2.8	-
24-Dec-2019	-	-	-	-	-	-
25-Dec-2019	-	-	-	-	-	-
27-Dec-2019	-	-	-	-	-	-
08-Jan-2020	-	2.8	-	2.8	-	-
09-Jan-2020	-	2.8	-	2.8	-	-
14-Jan-2020	-	2.8	-	2.8	-	-
16-Jan-2020	2.8	-	2.8	-	-	-
23-Jan-2020	2.8	-	7.8	-	-	-
24-Jan-2020	-	-	-	-	-	2.8
26-Jan-2020	-	-	-	-	-	2.8
27-Jan-2020	-	-	2.8	-	-	-
28-Jan-2020	2.8	-	-	-	-	-
30-Jan-2020	-	-	-	-	-	-
31-Jan-2020	-	-	-	-	2.8	2.8
04-Feb-2020	-	2.8	-	2.8	-	2.8
05-Feb-2020	-	-	-	2.8	-	-
06-Feb-2020	-	2.8	-	-	-	2.8
07-Feb-2020	-	2.8	-	2.8	-	2.8
14-Feb-2020	-	-	2.8	-	2.8	-
18-Feb-2020	-	-	2.8	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
19-Feb-2020	2.8	-	-	-		-
20-Feb-2020	2.8	-	2.8	-	2.8	-
21-Feb-2020	2.8	-	-	-	-	-
25-Feb-2020	-	-	-	-	-	-
26-Feb-2020	-	-	-	-	-	-
27-Feb-2020	-	-	-	-	-	-
03-Mar-2020	-	2.8	-	2.8	-	10.0
10-Mar-2020	-	5.8	-	8.5	-	2.8
12-Mar-2020	-	2.8	-	2.8	-	6.1
19-Mar-2020	2.8	-	2.8	-	2.8	-
24-Mar-2020	2.8	-	2.8	-	6.0	-
25-Mar-2020	2.8	-	2.8	-	2.8	-
26-Mar-2020	-	-	-	-	-	-
03-Apr-2020	-	2.8	-	-	-	-
31-Mar-2020	-		-	-	-	-
02-Apr-2020	-		-	2.8	-	2.8
07-Apr-2020	-	2.8	-	6.7	-	7.5
10-Apr-2020	-	2.8	-	2.8	-	2.8
16-Apr-2020	2.8	-	2.8	-	2.8	-
21-Apr-2020	2.8	-	2.8	-	2.8	-
22-Apr-2020	2.8	-	2.8	-	2.8	-
24-Apr-2020	-	-	-	-	-	-
28-Apr-2020	-	-	-	-	-	-
29-Apr-2020	-	-	-	-	-	-
30-Apr-2020	-	-	-	-	-	-
05-May-2020	-	2.8	-	2.8	-	2.8
06-May-2020	-	2.8	-	2.8	-	2.8
07-May-2020	-	2.8	-	2.8	-	2.8
19-May-2020	2.8	-	8.7	-	2.8	-
21-May-2020	2.8	-	10.8	-	2.8	-
26-May-2020	2.8	-	6.0	-	5.6	-
27-May-2020	-	-	-	-	-	-
29-May-2020	-	-	-	-	-	-
11-Jun-2020	-	2.8	-	2.8	-	-
17-Jun-2020	-	2.8	-	2.8	-	2.8
18-Jun-2020	-	2.8	-	2.8	-	2.8
22-Jun-2020	2.8	-	2.8	-	-	2.8
23-Jun-2020	2.8	-	2.8	-	2.8	-
24-Jun-2020	2.8	-	2.8	-	-	-
25-Jun-2020	-	-	-	-	2.8	-
30-Jun-2020	-	-	-	-	2.8	-
02-Jul-2020	-	2.8	-	2.8	-	2.8

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
09-Jul-2020	-	2.8	-	2.8	-	-
10-Jul-2020	-	-	-	-	-	2.8
16-Jul-2020	-	2.8	-	2.8	-	2.8
22-Jul-2020	2.8	-	2.8	-	2.8	-
23-Jul-2020	2.8	-	2.8	-	65.7 Y	-
28-Jul-2020	-	-	2.8	-	2.8	-
29-Jul-2020	7.2	-	-	-	-	-
30-Jul-2020	16.0	-	-	-	-	-
04-Aug-2020	-	2.8	-	2.8	-	2.8
06-Aug-2020	-	6.1	-	6.1	-	2.8
10-Aug-2020	-	2.8	-	2.8	-	2.8
23-Aug-2020	7.5	-	2.8	-	2.8	-
24-Aug-2020	6.9	-	2.8	-	2.8	-
25-Aug-2020	2.8	-	2.8	-	2.8	-
26-Aug-2020	-	-	-	-	-	-
27-Aug-2020	-	-	-	-	-	-
28-Aug-2020	-	-	-	-	-	-
29-Aug-2020	-	-	-	-	-	-
30-Aug-2020	-	-	-	-	-	-
02-Sep-2020	-	-	-	-	-	-
04-Sep-2020	-	-	-	-	-	-
06-Sep-2020	-	-	-	-	-	-
09-Sep-2020	2.8	-	2.8	-	2.8	-
10-Sep-2020	2.8	-	2.8	-	2.8	-
11-Sep-2020	2.8	-	2.8	-	2.8	-
12-Sep-2020	-	2.8	-	2.8	-	2.8
14-Sep-2020	-	2.8	-	2.8	-	2.8
24-Sep-2020	-	2.8	-	2.8	-	2.8
06-Oct-2020	-	-	-	-	-	-
07-Oct-2020	-	-	-	-	-	-
08-Oct-2020	-	-	-	-	-	-
11-Oct-2020	-	-	2.8	-	2.8	-
13-Oct-2020	2.8	-	-	-	-	-
15-Oct-2020	2.8	-	-	-	2.8	-
16-Oct-2020	-	-	2.8	-	-	-
19-Oct-2020	-	-	2.8	-	2.8	-
20-Oct-2020	2.8	-	-	-	-	-
23-Oct-2020	-	6.0	-	2.8	-	-
24-Oct-2020	-	2.8	-	2.8	-	-
25-Oct-2020	-	2.8	-	2.8	-	2.8
01-Nov-2020	-	-	-	-	-	6.0
22-Nov-2020	-	2.8	-	2.8	-	-

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
23-Nov-2020	-	2.8	-	2.8	-	-
24-Nov-2020	-	2.8	-	2.8	-	-
25-Nov-2020	2.8	-	2.8	-	-	-
30-Nov-2020	2.8	-	2.8	-	-	-
07-Dec-2020	-	-	-	-	-	-
08-Dec-2020	-	-	-	-	-	-
10-Dec-2020	-	-	-	-	-	-
11-Dec-2020	-	-	-	-	-	-
12-Dec-2020	2.8	-	2.8	-	-	-
13-Dec-2020	2.8	-	2.8	-	-	-
14-Dec-2020	2.8	-	2.8	-	-	-
17-Dec-2020	-	2.8	-	2.8	-	-
18-Dec-2020	-	2.8	-	2.8	-	-
19-Dec-2020	-	2.8	-	2.8	-	-
03-Jan-2021	-	-	2.8	-	-	-
04-Jan-2021	-	-	2.8	-	2.8	-
08-Jan-2021	-	-	2.8	-	-	-
10-Jan-2021	-	-	-	7.4	-	-
11-Jan-2021	-	-	-	2.8	-	-
13-Jan-2021	-	-	-	2.8	-	-
14-Jan-2021	-	-	-	2.8	-	2.8
16-Jan-2021	-	-	7.2	-	2.8	-
17-Jan-2021	-	-	-	2.8	-	-
07-Feb-2021	-	-	7.9	-	-	-
10-Feb-2021	-	-	10.7	-	-	-
12-Feb-2021	-	-	8.5	-	2.8	-
13-Feb-2021	-	-	-	2.8	-	-
15-Feb-2021	-	-	11.9	-	-	2.8
16-Feb-2021	-	-	2.8	-	-	2.8
17-Feb-2021	-	-	-	2.8	-	-
03-Mar-2021	-	-	-	2.8	-	-
04-Mar-2021	-	-	-	2.8	-	-
05-Mar-2021	-	-	-	2.8	-	2.8
06-Mar-2021	-	-	-	2.8	-	2.8
07-Mar-2021	-	-	2.8	-	2.8	-
09-Mar-2021	-	-	2.8	-	2.8	-
10-Mar-2021	-	-	2.8	-	2.8	-
05-Apr-2021	-	-	2.8	-	2.8	-
15-Apr-2021	-	-	2.8	-	2.8	-
16-Apr-2021	-	-	6	-	2.8	-
17-Apr-2021	-	-	-	5.6	-	2.8
18-Apr-2021	-	-	-	7.1	-	2.8

Note: - indicates not applicable

ATTACHMENT A2
AVERAGE PM10 AND PM2.5 RESULTS (24-HOUR), AUG. 2015 – DEC. 2021

Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
20-Apr-2021	-	-	-	6.7	-	2.8
03-May-2021	-	-	-	5.6	-	2.8
04-May-2021	-	-	-	2.8	-	2.8
05-May-2021	-	-	-	2.8	-	-
06-May-2021	-	-	-	8.1	-	-
10-May-2021	-	-	11.8	-	2.8	-
13-May-2021	-	-	2.8	-	2.8	-
14-May-2021	-	-	2.8	-	2.8	-
09-Jun-2021	-	-	28.1	-	2.8	-
10-Jun-2021	-	-	28.5	-	2.8	-
14-Jun-2021	-	-	7.1	-	2.8	-
18-Jun-2021	-	-	-	10	-	7.4
22-Jun-2021	-	-	-	31.4 Y	-	2.8
28-Jun-2021	-	-	-	15.1	-	2.8
14-Oct-2021	-	-	-	2.8	2.8	-
15-Oct-2021	-	-	-	2.8	2.8	-
16-Oct-2021	-	-	-	2.8	2.8	-
17-Oct-2021	-	-	-	2.8	-	2.8
01-Dec-2021	-	-	2.8	-	-	-
07-Dec-2021	-	-	2.8	-	-	8.7
08-Dec-2021	-	-	2.8	-	-	6.1
09-Dec-2021	-	-	-	2.8	6.7	-
10-Dec-2021	-	-	-	2.8	2.8	-
12-Dec-2021	-	-	-	2.8	9.9	-
27-Dec-2021	-	-	-	-	-	-
28-Dec-2021	-	-	-	-	-	-
30-Dec-2021	-	-	-	-	-	-
31-Dec-2021	-	-	8.7	-	2.8	-

Note: - indicates not applicable

ATTACHMENT A3

METAL CONCENTRATIONS (24-HOUR), TSP-1, AUG. 2012 – DEC. 2020

ATTACHMENT A3
METAL CONCENTRATIONS (24-HOUR), TSP-1, AUG. 2012 – DEC. 2020

Sample Date	Aluminum (Al), µg/m ³	Antimony (Sb), µg/m ³	Arsenic (As), µg/m ³	Barium (Ba), µg/m ³	Beryllium (Be), µg/m ³	Boron (B), µg/m ³	Cadmium (Cd), µg/m ³	Calcium (Ca), µg/m ³	Chromium (Cr), µg/m ³	Cobalt (Co), µg/m ³	Copper (Cu), µg/m ³	Iron (Fe), µg/m ³	Lead (Pb), µg/m ³	Magnesium (Mg), µg/m ³	Manganese (Mn), µg/m ³	Molybdenum (Mo), µg/m ³	Nickel (Ni), µg/m ³	Phosphorus (P), µg/m ³	Potassium (K), µg/m ³	Selenium (Se), µg/m ³	Silicon (Si), µg/m ³	Silver (Ag), µg/m ³	Sodium (Na), µg/m ³	Strontium (Sr), µg/m ³	Sulphur (S), µg/m ³	Tin (Sn), µg/m ³	Titanium (Ti), µg/m ³	Vanadium (V), µg/m ³	Zinc (Zn), µg/m ³	Zirconium (Zr), µg/m ³
Ontario AADC (24-hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.5	0.4	120	0.4	120	0.2	0.2	0.694	0.03472	-	1	120	10	120	2	120			
23-Aug-12	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.486	0.0208	0.03472	0.035	0.554	0.17361	0.061	0.045	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.7	0.05556	0.014	0.021	0.0181	0.035
27-Sep-12	0.667	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	1.722	0.0208	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
1-Oct-12	0.633	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	1.43	0.0208	0.03472	0.035	2.528	1.48318	0.308	0.261	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.6	0.05556	0.014	0.021	0.0181	0.035
15-Dec-12	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.194	0.13889	0.021	0.052	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
14-Jan-13	0.403	0.13889	0.05556	0.0097	0.05556	0.021	0.01389	2.069	0.0208	0.03472	0.035	0.815	0.05556	0.217	0.026	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.875	0.00736	0.6	0.17361	0.014	0.021	0.0158	0.035
16-Jan-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.444	0.0208	0.03472	0.035	0.126	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
23-Mar-13	0.292	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	1.347	0.0208	0.03472	0.035	0.138	0.05556	0.072	0.034	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.3	0.05556	0.014	0.021	0.0181	0.035
24-Mar-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.907	0.0208	0.03472	0.035	0.097	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
25-Mar-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0569	0.03472	0.035	0.318	0.05556	0.058	0.021	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
26-Mar-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.168	0.05556	0.057	0.019	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
10-Apr-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.272	0.05556	0.082	0.017	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.3	0.05556	0.014	0.021	0.0181	0.035
13-Apr-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.306	0.0528	0.03472	0.035	0.465	0.05556	0.106	0.022	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.4	0.05556	0.014	0.021	0.0181	0.035
15-Apr-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0472	0.03472	0.035	0.169	0.05556	0.061	0.026	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.3	0.05556	0.014	0.021	0.0181	0.035
16-Apr-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.107	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0181	0.035
28-May-13	5.292	0.13889	0.05556	0.0094	0.05556	0.264	0.01389	8.722	0.0486	0.03472	0.035	0.312	0.05556	0.222	0.013	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.583	0.01708	0.3	0.05556	0.014	0.021	0.0192	0.035
16-Jun-13	5.236	0.13889	0.05556	0.0118	0.05556	0.264	0.01389	8.597	0.0764	0.03472	0.035	0.879	0.22361	0.211	0.083	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.722	0.01639	0.3	0.05556	0.014	0.021	0.01639	0.035
18-Jun-13	0.861	0.13889	0.05556	0.0188	0.05556	0.021	0.01389	1.417	0.075	0.03472	0.035	2.153	0.79444	0.318	0.218	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.569	0.00458	0.7	0.05556	0.042	0.021	0.0319	0.035
24-Jun-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1028	0.03472	0.035	0.45	0.05556	0.021	0.018	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.444	0.00208	0.1	0.05556	0.014	0.021	0.0191	0.035
19-Jul-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1278	0.03472	0.035	0.419	0.05556	0.021	0.017	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
20-Jul-13	0.139	0.13889	0.05556	0.0046	0.05556	0.021	0.01389	0.444	0.1	0.03472	0.035	1.367	0.05556	0.096	0.015	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.01958	0.035
21-Jul-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1056	0.03472	0.035	0.322	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
23-Jul-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1194	0.03472	0.035	0.493	0.05556	0.021	0.012	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
22-Aug-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0778	0.03472	0.035	0.33	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0192	0.035
23-Aug-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0528	0.03472	0.035	0.194	0.05556	0.054	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
24-Aug-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0875	0.03472	0.035	0.388	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
25-Aug-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0458	0.03472	0.035	0.208	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
25-Sep-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0556	0.03472	0.035	0.199	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
27-Sep-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0861	0.03472	0.035	0.435	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
28-Sep-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0833	0.03472	0.035	0.351	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
29-Sep-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0875	0.03472	0.035	0.672	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
25-Oct-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.36	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
27-Oct-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1028	0.03472	0.035	0.263	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
27-Oct-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.331	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.020208	0.1	0.05556	0.014	0.021	0.0191	0.035
28-Oct-13	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0972	0.03472	0.035	0.308	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208</							

ATTACHMENT A3
METAL CONCENTRATIONS (24-HOUR), TSP-1, AUG. 2012 – DEC. 2020

Sample Date	Aluminum (Al), µg/m ³	Antimony (Sb), µg/m ³	Arsenic (As), µg/m ³	Barium (Ba), µg/m ³	Beryllium (Be), µg/m ³	Boron (B), µg/m ³	Cadmium (Cd), µg/m ³	Calcium (Ca), µg/m ³	Chromium (Cr), µg/m ³	Cobalt (Co), µg/m ³	Copper (Cu), µg/m ³	Iron (Fe), µg/m ³	Lead (Pb), µg/m ³	Magnesium (Mg), µg/m ³	Manganese (Mn), µg/m ³	Molybdenum (Mo), µg/m ³	Nickel (Ni), µg/m ³	Phosphorus (P), µg/m ³	Potassium (K), µg/m ³	Selenium (Se), µg/m ³	Silicon (Si), µg/m ³	Silver (Ag), µg/m ³	Sodium (Na), µg/m ³	Strontium (Sr), µg/m ³	Sulphur (S), µg/m ³	Tin (Sn), µg/m ³	Titanium (Ti), µg/m ³	Vanadium (V), µg/m ³	Zinc (Zn), µg/m ³	Zirconium (Zr), µg/m ³	
Ontario AADC (24-hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.4	120	2	10	1	10	120	1	120	1	1	120	1	10	120	1	10	120	1	10
02-Apr-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0736	0.03472	0.035	0.344	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
03-Apr-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1014	0.03472	0.035	0.464	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
04-Apr-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.075	0.03472	0.035	0.31	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
05-Apr-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0639	0.03472	0.035	0.05	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
25-May-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.292	0.05	0.03472	0.035	0.326	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0139	0.035	
26-May-15	0.139	0.13889	0.05556	0.0042	0.05556	0.021	0.01389	0.292	0.0667	0.03472	0.035	0.314	0.05556	0.021	0.023	0.03472	0.03472	0.208	0.694	0.03472	0.458	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0292	0.035	
27-May-15	0.444	0.13889	0.05556	0.0049	0.05556	0.021	0.01389	1.139	0.0208	0.03472	0.035	0.24	0.05556	0.122	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00264	0.3	0.05556	0.014	0.021	0.0139	0.035	
28-May-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.431	0.0597	0.03472	0.035	0.431	0.05556	0.089	0.021	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00258	0.3	0.05556	0.014	0.021	0.0139	0.035	
16-Jun-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0569	0.03472	0.035	0.21	0.05556	0.064	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Jun-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0528	0.03472	0.035	0.221	0.05556	0.064	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.681	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Jun-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0528	0.03472	0.035	0.221	0.05556	0.057	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.931	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
01-Jul-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.108	0.05556	0.05	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
08-Jul-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0472	0.03472	0.035	0.021	0.05556	0.051	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	2.444	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
11-Jul-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0486	0.03472	0.035	0.09	0.05556	0.051	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
20-Jul-15	0.139	0.13889	0.05556	0.0042	0.05556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.112	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
13-Aug-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0458	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
14-Aug-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0611	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
15-Aug-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.05	0.03472	0.035	0.21	0.05556	0.049	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Aug-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0528	0.03472	0.035	0.239	0.05556	0.06	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Sep-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
20-Oct-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0917	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
21-Oct-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0722	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.01417	0.035	
13-Nov-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0778	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
14-Nov-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0681	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Nov-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0542	0.03472	0.035	0.021	0.05556	0.021	0.011	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Nov-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0639	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Nov-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0667	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Dec-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0778	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Dec-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0681	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Dec-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0736	0.03472	0.035	0.044	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
19-Dec-15	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0528	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
05-Jan-16	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0625	0.03472	0.035	0.079	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
06-Jan-16	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0653	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
12-Jan-16	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0681	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.2													

ATTACHMENT A3
METAL CONCENTRATIONS (24-HOUR), TSP-1, AUG. 2012 – DEC. 2020

Sample Date	Aluminum (Al), µg/m ³	Antimony (Sb), µg/m ³	Arsenic (As), µg/m ³	Barium (Ba), µg/m ³	Beryllium (Be), µg/m ³	Boron (B), µg/m ³	Cadmium (Cd), µg/m ³	Calcium (Ca), µg/m ³	Chromium (Cr), µg/m ³	Cobalt (Co), µg/m ³	Copper (Cu), µg/m ³	Iron (Fe), µg/m ³	Lead (Pb), µg/m ³	Magnesium (Mg), µg/m ³	Manganese (Mn), µg/m ³	Molybdenum (Mo), µg/m ³	Nickel (Ni), µg/m ³	Phosphorus (P), µg/m ³	Potassium (K), µg/m ³	Selenium (Se), µg/m ³	Silicon (Si), µg/m ³	Silver (Ag), µg/m ³	Sodium (Na), µg/m ³	Strontium (Sr), µg/m ³	Sulphur (S), µg/m ³	Tin (Sn), µg/m ³	Titanium (Ti), µg/m ³	Vanadium (V), µg/m ³	Zinc (Zn), µg/m ³	Zirconium (Zr), µg/m ³				
Ontario AADC (24-hr avg)	25	0.3	0.1	10	0.01	120	0.025	0.5	0.1	0.5	4	0.5	0.4	120	0.4	120	0.2	1	1	1	1	1	1	120	10	120	0.1	10	120	0.1	120			
02-Nov-17	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
16-Nov-17	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.075	0.03472	0.035	0.049	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
17-Nov-17	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
13-Dec-17	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0556	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
15-Dec-17	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.444	0.0639	0.03472	0.035	0.054	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.764	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
19-Dec-17	0.139	0.13889	0.05556	0.0104	0.00556	0.021	0.01389	0.528	0.1097	0.03472	0.035	0.081	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.903	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
31-Jan-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.361	0.0708	0.03472	0.035	0.044	0.05556	0.049	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.021	0.0139	0.035			
07-Feb-18	0.139	0.13889	0.05556	0.0047	0.00556	0.021	0.01389	0.514	0.0722	0.03472	0.035	0.069	0.05556	0.043	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0611	0.035			
09-Feb-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.528	0.0144	0.03472	0.035	0.053	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0611	0.035			
14-Feb-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.542	0.0806	0.03472	0.035	0.058	0.05556	0.042	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
16-Mar-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.347	0.0667	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0306	0.035			
20-Mar-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.375	0.0625	0.03472	0.035	0.057	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
21-Mar-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.444	0.0764	0.03472	0.035	0.055	0.05556	0.044	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
03-Apr-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.333	0.0875	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
04-Apr-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.389	0.1097	0.03472	0.035	0.042	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0403	0.035			
24-May-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.431	0.0833	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0292	0.035			
26-May-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.431	0.0819	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0139	0.035			
05-Jun-18	0.029	0.00035	0.00035	0.0012	0.00035	0.021	0.00007	0.431	0.0343	0.00035	0.005	0.056	0.00035	0.051	0.002	0.00021	0.00133	0.056	0.035	0.00035	0.139	0.00014	0.181	0.00014	0.208	0.00014	0.194	0.00144	69.4	0.00035	0.014	0.014	0.0035	0.003
06-Jun-18	0.029	0.00035	0.00035	0.0012	0.00035	0.021	0.00007	0.417	0.0672	0.00035	0.001	0.069	0.00181	0.049	0.002	0.00021	0.00035	0.056	0.035	0.00035	0.139	0.00014	0.194	0.00144	69.4	0.00035	0.014	0.014	0.0035	0.003	0.003			
08-Jun-18	0.057	0.00035	0.00035	0.0008	0.00035	0.021	0.00021	0.361	0.0762	0.00035	0.002	0.085	0.0009	0.047	0.002	0.00021	0.00168	0.056	0.035	0.00035	0.139	0.00014	0.208	0.00083	69.4	0.00035	0.014	0.014	0.0035	0.003	0.003			
13-Jul-18	0.042	0.00035	0.00035	0.0014	0.00035	0.021	0.00021	0.208	0.0385	0.00035	0.001	0.119	0.01403	0.021	0.006	0.00021	0.00136	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0097	0.003	0.003			
17-Jul-18	0.046	0.00035	0.00035	0.002	0.00035	0.021	0.00007	0.139	0.0562	0.00035	0.001	0.064	0.0025	0.021	0.002	0.00021	0.00136	0.056	0.035	0.00035	0.139	0.00014	0.167	0.00106	69.4	0.00035	0.014	0.014	0.0074	0.003	0.003			
18-Jul-18	0.041	0.00035	0.00035	0.0012	0.00035	0.021	0.00007	0.181	0.0305	0.00035	0.001	0.054	0.0021	0.021	0.002	0.00021	0.00119	0.056	0.035	0.00035	0.139	0.00014	0.181	0.00106	69.4	0.00035	0.014	0.014	0.0075	0.003	0.003			
23-Aug-18	0.047	0.00035	0.00035	0.0044	0.00035	0.021	0.00019	0.139	0.0796	0.00035	0.003	0.082	0.00276	0.021	0.004	0.00021	0.00174	0.056	0.074	0.00035	0.139	0.00014	0.222	0.00035	69.4	0.00035	0.014	0.014	0.0081	0.003	0.003			
25-Aug-18	0.048	0.00035	0.00035	0.0016	0.00035	0.021	0.00015	0.167	0.0739	0.00035	0.003	0.162	0.00147	0.021	0.002	0.00021	0.00168	0.056	0.078	0.00035	0.139	0.00014	0.222	0.00035	69.4	0.00035	0.014	0.014	0.01	0.003	0.003			
26-Aug-18	0.038	0.00035	0.00035	0.0011	0.00035	0.021	0.00007	0.194	0.0871	0.00035	0.002	0.303	0.00775	0.021	0.003	0.00256	0.00201	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00069	69.4	0.00035	0.014	0.014	0.0087	0.003	0.003			
02-Sep-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.417	0.0514	0.03472	0.035	0.021	0.05556	0.053	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.625	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0381	0.035			
03-Sep-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.486	0.0561	0.03472	0.035	0.021	0.05556	0.053	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.748	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0381	0.035			
05-Sep-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	1.139	0.0444	0.03472	0.035	0.021	0.05556	0.064	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.667	0.00208	0.3	0.05556	0.014	0.021	0.021	0.3444	0.035			
26-Oct-18	0.139	0.13889	0.05556	0.0078	0.00556	0.021	0.01389	0.361	0.0931	0.03472	0.035	0.071	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0972	0.035			
30-Oct-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.403	0.0722	0.03472	0.035	0.046	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00486	0.1	0.05556	0.014	0.021	0.021	0.1083	0.035			
13-Nov-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.347	0.0597	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.021	0.0875	0.035			
03-Dec-18	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.472	0.0562	0.03472	0.035																							

ATTACHMENT A4

METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 – DEC. 2021

ATTACHMENT A4
METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 – DEC. 2021

Sample Date	Aluminum (Al), µg/m³	Antimony (Sb), µg/m³	Arsenic (As), µg/m³	Barium (Ba), µg/m³	Beryllium (Be), µg/m³	Boron (B), µg/m³	Cadmium (Cd), µg/m³	Calcium (Ca), µg/m³	Chromium (Cr), µg/m³	Cobalt (Co), µg/m³	Copper (Cu), µg/m³	Iron (Fe), µg/m³	Lead (Pb), µg/m³	Magnesium (Mg), µg/m³	Manganese (Mn), µg/m³	Molybdenum (Mo), µg/m³	Nickel (Ni), µg/m³	Phosphorus (P), µg/m³	Potassium (K), µg/m³	Selenium (Se), µg/m³	Silicon (Si), µg/m³	Silver (Ag), µg/m³	Sodium (Na), µg/m³	Strontium (Sr), µg/m³	Sulphur (S), µg/m³	Tin (Sn), µg/m³	Titanium (Ti), µg/m³	Vanadium (V), µg/m³	Zinc (Zn), µg/m³	Zirconium (Zr), µg/m³	
Ontario AQIC (24 hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	120	2	10	1	120	2	10	120	2	10	1	120	2	10	120	2	10	120	2	10
23-Aug-2012	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.439	0.73611 O	0.047	0.033	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.1083	0.035	
27-Sep-2012	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0389	0.035	
15-Dec-2012	0.139	0.13889	0.05556	0.0042	0.00556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.533	0.18056	0.076	0.066	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.1222	0.035	
16-Jan-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0208	0.03472	0.035	0.143	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0319	0.035	
23-Mar-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0208	0.03472	0.035	1.431	0.32083	0.089	0.407 O	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.2444	0.035	
24-Mar-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.486	0.0208	0.03472	0.035	1.174	0.36111	0.124	0.651 O	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.2778	0.035	
25-Mar-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.417	0.0556	0.03472	0.035	1.162	0.36667	0.108	0.39	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.2639	0.035	
26-Mar-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.375	0.0458	0.03472	0.035	0.921	0.15278	0.117	0.29	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.1417	0.035	
07-Apr-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.486	0.0208	0.03472	0.035	1.161	0.41667	0.119	0.471 O	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.2944	0.035	
10-Apr-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.439	0.05556	0.081	0.049	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0694	0.035	
13-Apr-2013	0.306	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0444	0.03472	0.035	0.199	0.05556	0.081	0.017	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0319	0.035	
15-Apr-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0472	0.03472	0.035	0.268	0.05556	0.079	0.025	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0139	0.035	
16-Apr-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.165	0.05556	0.065	0.012	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0319	0.035	
17-Jun-2013	0.361	0.13889	0.05556	0.0087	0.00556	0.021	0.01389	0.708	0.0208	0.03472	0.035	0.232	0.05556	0.053	0.016	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Jun-2013	1.583	0.13889	0.05556	0.0053	0.00556	0.071	0.01389	2.569	0.1222	0.03472	0.035	0.825	0.13333	0.094	0.078	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.542	0.00486	0.1	0.05556	0.014	0.021	0.0958	0.035	
21-Jun-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0889	0.03472	0.035	0.432	0.05556	0.021	0.014	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.472	0.00208	0.1	0.05556	0.014	0.021	0.0319	0.035	
23-Jun-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.361	0.0542	0.03472	0.035	0.282	0.05556	0.072	0.017	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0306	0.035	
28-Jun-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.5	0.0542	0.03472	0.035	0.414	0.05556	0.082	0.046	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0708	0.035	
19-Jul-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1167	0.03472	0.035	0.526	0.05556	0.021	0.027	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0389	0.035	
20-Jul-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0653	0.03472	0.035	0.381	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
21-Jul-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.5	0.05556	0.021	0.052	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0292	0.035	
22-Jul-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.292	0.0944	0.03472	0.035	1.122	0.05556	0.071	0.134	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0917	0.035	
22-Aug-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0944	0.03472	0.035	0.314	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0278	0.035	
25-Aug-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.129	0.05	0.03472	0.035	0.185	0.05556	0.047	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
26-Aug-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0736	0.03472	0.035	0.496	0.05556	0.021	0.012	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0458	0.035	
28-Aug-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0708	0.03472	0.035	0.496	0.05556	0.021	0.046	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.1222	0.035	
31-Aug-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0569	0.03472	0.035	0.2	0.05556	0.047	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
21-Sep-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0972	0.03472	0.035	0.347	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
24-Sep-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1139	0.03472	0.035	0.424	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
27-Sep-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1264	0.03472	0.035	0.479	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0319	0.035	
28-Sep-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0861	0.03472	0.035	0.338	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0472	0.035	
30-Sep-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0694	0.03472	0.035	0.45	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
24-Oct-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0764	0.03472	0.035	0.326	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
25-Oct-2013	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.303	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	-	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
26-Oct-2013	0.292	0.13889	0.05556	0.0021	0.00556	0.078																									

ATTACHMENT A4
METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 - DEC. 2021

Sample Date	Aluminum (Al), µg/m³	Antimony (Sb), µg/m³	Arsenic (As), µg/m³	Barium (Ba), µg/m³	Beryllium (Be), µg/m³	Boron (B), µg/m³	Cadmium (Cd), µg/m³	Calcium (Ca), µg/m³	Chromium (Cr), µg/m³	Cobalt (Co), µg/m³	Copper (Cu), µg/m³	Iron (Fe), µg/m³	Lead (Pb), µg/m³	Magnesium (Mg), µg/m³	Manganese (Mn), µg/m³	Molybdenum (Mo), µg/m³	Nickel (Ni), µg/m³	Phosphorus (P), µg/m³	Potassium (K), µg/m³	Selenium (Se), µg/m³	Silicon (Si), µg/m³	Silver (Ag), µg/m³	Sodium (Na), µg/m³	Strontium (Sr), µg/m³	Sulphur (S), µg/m³	Tin (Sn), µg/m³	Titanium (Ti), µg/m³	Vanadium (V), µg/m³	Zinc (Zn), µg/m³	Zirconium (Zr), µg/m³	
Ontario AQIC (24 hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.4	120	2	10	1	120	2	120	10	120	2	120	10	120	2	120	10	120	2	120
27-Sep-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1	0.03472	0.035	0.354	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.458	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
15-Oct-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0694	0.03472	0.035	0.242	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	2.167	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Oct-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0875	0.03472	0.035	0.239	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
23-Oct-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0903	0.03472	0.035	0.386	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
24-Oct-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0542	0.03472	0.035	0.161	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
22-Nov-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1119	0.03472	0.035	0.333	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.611	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
23-Nov-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1153	0.03472	0.035	0.339	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.833	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
25-Nov-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1042	0.03472	0.035	0.258	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.458	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
12-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0944	0.03472	0.035	0.362	0.05556	0.021	0.017	0.03472	0.03472	0.208	0.694	0.03472	1.167	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
13-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1139	0.03472	0.035	0.414	0.05556	0.021	0.043	0.03472	0.03472	0.208	0.694	0.03472	1.361	0.02083	0.917	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
14-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.378	0.05556	0.021	0.021	0.03472	0.03472	0.208	0.694	0.03472	0.833	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
15-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1264	0.03472	0.035	0.381	0.05556	0.021	0.02	0.03472	0.03472	0.208	0.694	0.03472	0.931	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
10-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1097	0.03472	0.035	0.342	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.444	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
11-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.281	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
13-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0611	0.03472	0.035	0.262	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
15-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0611	0.03472	0.035	0.333	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
12-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0653	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.75	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
13-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0569	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
15-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0583	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.075	0.03472	0.035	0.304	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
06-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0625	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.014	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
07-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0694	0.03472	0.035	0.137	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0542	0.03472	0.035	0.075	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0597	0.03472	0.035	0.05	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
02-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.357	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
03-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1042	0.03472	0.035	0.281	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
04-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0833	0.03472	0.035	0.306	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
05-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0486	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
25-May-2015	0.139	0.13889	0.05556	0.0476	0.00556	0.021	0.01389	0.611	0.0556	0.03472	0.035	1.015	0.05556	0.167	0.117	0.03472	0.03472	0.208	0.694	0.03472	0.444	0.02083	0.208	0.00208	0.6	0.05556	0.014	0.021	0.0094	0.035	
26-May-2015	0.139	0.13889	0.05556	0.0062	0.00556	0.021	0.01389	0.625	0.05	0.03472	0.035	0.96	0.05556	0.186	0.101	0.03472	0.03472	0.208	0.694	0.03472	0.556	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0039	0.035	
27-May-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.353	0.05556	0.005	0.018	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0139	0.035	
28-May-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0431	0.03472	0.035	0.347	0.05556	0.075	0.023	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
16-Jun-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0708	0.03472	0.035	0.238	0.05556	0.061	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
17-Jun-2015	0.139	0.13889	0.05556	0.0083	0.00556	0.021	0.01389	0.139	0.0611	0.03472	0.035	0.179	0.05556	0.064	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.5	0.02083	0.208	0.00208	0.3</						

ATTACHMENT A4
METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 - DEC. 2021

Sample Date	Aluminum (Al), µg/m³	Antimony (Sb), µg/m³	Arsenic (As), µg/m³	Barium (Ba), µg/m³	Beryllium (Be), µg/m³	Boron (B), µg/m³	Cadmium (Cd), µg/m³	Calcium (Ca), µg/m³	Chromium (Cr), µg/m³	Cobalt (Co), µg/m³	Copper (Cu), µg/m³	Iron (Fe), µg/m³	Lead (Pb), µg/m³	Magnesium (Mg), µg/m³	Manganese (Mn), µg/m³	Molybdenum (Mo), µg/m³	Nickel (Ni), µg/m³	Phosphorus (P), µg/m³	Potassium (K), µg/m³	Selenium (Se), µg/m³	Silicon (Si), µg/m³	Silver (Ag), µg/m³	Sodium (Na), µg/m³	Strontium (Sr), µg/m³	Sulphur (S), µg/m³	Tin (Sn), µg/m³	Titanium (Ti), µg/m³	Vanadium (V), µg/m³	Zinc (Zn), µg/m³	Zirconium (Zr), µg/m³	
Ontario AQIC (24 hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.4	120	2	10	1	120	10	120	2	120	1	120	120	10	120	2	120	120	10	120
28-Nov-2016	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0722	0.03472	0.035	0.05	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
27-Dec-2016	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0931	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
29-Dec-2016	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1083	0.03472	0.035	0.062	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00556	0.1	0.05556	0.014	0.021	0.0139	0.035	
30-Dec-2016	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0958	0.03472	0.035	0.082	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00486	0.1	0.05556	0.014	0.021	0.0139	0.035	
28-Jan-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0861	0.03472	0.035	0.044	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00458	0.1	0.05556	0.014	0.021	0.0139	0.035	
29-Jan-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0694	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00625	0.1	0.05556	0.014	0.021	0.0139	0.035	
30-Jan-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1194	0.03472	0.035	0.185	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00667	0.1	0.05556	0.014	0.021	0.0139	0.035	
02-Feb-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0917	0.03472	0.035	0.06	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
14-Feb-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0903	0.03472	0.035	0.124	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Feb-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.072	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00625	0.1	0.05556	0.014	0.021	0.0139	0.035	
19-Feb-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0792	0.03472	0.035	0.068	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
23-Mar-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1028	0.03472	0.035	0.185	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00458	0.1	0.05556	0.014	0.021	0.0139	0.035	
27-Mar-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0694	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
28-Mar-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.292	0.0917	0.03472	0.035	0.26	0.05556	0.021	0.025	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.02361	0.1	0.05556	0.014	0.021	0.0139	0.035	
14-Apr-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.611	0.1014	0.03472	0.035	0.089	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00764	0.1	0.05556	0.014	0.021	0.0139	0.035	
18-Apr-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.375	0.125	0.03472	0.035	0.458	0.05556	0.086	0.03	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00875	0.3	0.05556	0.014	0.021	0.0139	0.035	
20-Apr-2017	0.139	0.13889	0.05556	0.0042	0.00556	0.021	0.01389	0.347	0.1111	0.03472	0.035	0.349	0.05556	0.081	0.029	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.417	0.00972	0.1	0.05556	0.014	0.021	0.0139	0.035	
25-May-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.458	0.0736	0.03472	0.035	0.107	0.05556	0.064	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.411	0.00667	0.1	0.05556	0.014	0.021	0.0139	0.035	
26-May-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1308	0.03472	0.035	0.071	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
30-May-2017	0.139	0.13889	0.05556	0.0042	0.00556	0.021	0.01389	0.403	0.0861	0.03472	0.035	0.643	0.05556	0.129	0.078	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00556	0.1	0.05556	0.014	0.021	0.0597	0.035	
01-Jun-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0972	0.03472	0.035	0.134	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00486	0.1	0.05556	0.014	0.021	0.0139	0.035	
08-Jun-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0986	0.03472	0.035	0.123	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0261	0.035	
09-Jun-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.1111	0.03472	0.035	0.162	0.05556	0.047	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
13-Jun-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.306	0.1306	0.03472	0.035	0.547	0.05556	0.065	0.04	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
04-Jul-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1125	0.03472	0.035	1.058	0.05556	0.021	0.022	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
05-Jul-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.236	0.05556	0.054	0.026	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
07-Jul-2017	0.139	0.13889	0.05556	0.0042	0.00556	0.021	0.01389	0.431	0.0819	0.03472	0.035	0.608	0.05556	0.144	0.088	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0542	0.035	
09-Aug-2017	0.653	0.13889	0.05556	0.0201	0.00556	0.021	0.01389	1.278	0.0764	0.03472	0.035	2.778	0.36944	0.468	0.404	0.03472	0.03472	0.208	0.694	0.03472	1.097	0.02083	0.208	0.00486	0.6	0.05556	0.032	0.021	0.2764	0.035	
11-Aug-2017	0.139	0.13889	0.05556	0.0087	0.00556	0.021	0.01389	0.514	0.0597	0.03472	0.035	1.046	0.1625	0.167	0.164	0.03472	0.03472	0.208	0.694	0.03472	0.556	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.1153	0.035	
15-Aug-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1	0.03472	0.035	0.15	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
20-Sep-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.472	0.1014	0.03472	0.035	0.05	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
26-Sep-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.444	0.1056	0.03472	0.035	0.054	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
29-Sep-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.444	0.1458	0.03472	0.035	0.086	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035	
03-Oct-2017	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.139	0.1153	0.03472	0.035	0.082	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.						

ATTACHMENT A4
METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 – DEC. 2021

Sample Date	Aluminum (Al), µg/m³	Antimony (Sb), µg/m³	Arsenic (As), µg/m³	Barium (Ba), µg/m³	Beryllium (Be), µg/m³	Boron (B), µg/m³	Cadmium (Cd), µg/m³	Calcium (Ca), µg/m³	Chromium (Cr), µg/m³	Cobalt (Co), µg/m³	Copper (Cu), µg/m³	Iron (Fe), µg/m³	Lead (Pb), µg/m³	Magnesium (Mg), µg/m³	Manganese (Mn), µg/m³	Molybdenum (Mo), µg/m³	Nickel (Ni), µg/m³	Phosphorus (P), µg/m³	Potassium (K), µg/m³	Selenium (Se), µg/m³	Silicon (Si), µg/m³	Silver (Ag), µg/m³	Sodium (Na), µg/m³	Strontium (Sr), µg/m³	Sulphur (S), µg/m³	Tin (Sn), µg/m³	Titanium (Ti), µg/m³	Vanadium (V), µg/m³	Zinc (Zn), µg/m³	Zirconium (Zr), µg/m³
Ontario AQIC (24 hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.4	120	2	10	1	120	10	120	2	120	1	120	10	120	10	120	2	120	
26-Feb-2019	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.361	0.0681	0.03472	0.035	0.054	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0694	0.035
27-Feb-2019	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.375	0.0625	0.03472	0.035	0.043	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0694	0.035
28-Feb-2019	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.361	0.0792	0.03472	0.035	0.051	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0736	0.035
05-Mar-2019	0.014	0.00035	0.00035	0.0011	0.00035	0.021	0.00007	0.472	0.0793	0.00035	0.001	0.043	0.00074	0.021	0.001	0.00021	0.00112	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00075	69.4	0.00035	0.014	0.014	0.2333	0.003
06-Mar-2019	0.014	0.00035	0.00035	0.0018	0.00035	0.021	0.00019	0.5	0.0942	0.00035	0.001	0.064	0.00786	0.044	0.001	0.00069	0.00119	0.056	0.035	0.00035	0.139	0.00014	0.194	0.001	69.4	0.00035	0.014	0.014	0.2083	0.003
07-Mar-2019	0.014	0.00035	0.00035	0.0012	0.00035	0.021	0.00018	0.5	0.0671	0.00035	0.001	0.047	0.00035	0.042	0.001	0.00058	0.00126	0.056	0.035	0.00035	0.139	0.00014	0.167	0.00097	69.4	0.00035	0.014	0.014	0.2703	0.003
19-Apr-2019	0.038	0.00035	0.00035	0.0022	0.00035	0.021	0.00007	0.486	0.0594	0.00035	0.001	0.075	0.0044	0.044	0.003	0.00021	0.00082	0.056	0.035	0.00035	0.139	0.00014	0.069	0.0011	69.4	0.00035	0.014	0.014	0.1417	0.003
20-Apr-2019	0.061	0.00035	0.00072	0.0018	0.00035	0.021	0.00147	0.5	0.0714	0.00035	0.004	0.193	0.02847	0.058	0.009	0.00021	0.00212	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00115	69.4	0.00035	0.014	0.014	0.1778	0.003
25-Apr-2019	0.04	0.00035	0.00035	0.0016	0.00035	0.021	0.00025	0.444	0.0674	0.00035	0.002	0.085	0.00221	0.021	0.002	0.00021	0.0015	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00096	69.4	0.00035	0.014	0.014	0.2333	0.003
01-May-2019	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00031	0.069	0.0775	0.00035	0	0.053	0.0011	0.021	0.001	0.00021	0.00215	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00096	69.4	0.00035	0.014	0.014	0.2035	0.003
07-May-2019	0.16	0.00119	0.00632	0.0045	0.00035	0.021	0.00093	0.417	0.1149	0.00035	0.004	0.633	0.10278	0.11	0.086	0.00021	0.00188	0.056	0.035	0.00035	0.139	0.00082	0.194	0.00164	69.4	0.00035	0.014	0.014	0.0676	0.003
09-May-2019	0.043	0.00035	0.00128	0.0016	0.00035	0.021	0.00021	0.069	0.0622	0.00035	0.001	0.075	0.00662	0.021	0.002	0.00021	0.00106	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00076	69.4	0.00035	0.014	0.014	0.0395	0.003
29-Jun-2019	0.122	0.00035	0.00222	0.0048	0.00035	0.021	0.00042	0.611	0.0825	0.00035	0.004	0.385	0.02625	0.089	0.034	0.00046	0.00225	0.056	0.035	0.00035	0.139	0.00014	0.25	0.0014	69.4	0.00035	0.014	0.014	0.0689	0.003
21-Jul-2019	0.121	0.00035	0.00099	0.0079	0.00035	0.021	0.00072	0.736	0.0826	0.00035	0.002	0.487	0.04069	0.115	0.048	0.00021	0.00181	0.056	0.035	0.00035	0.306	0.00014	0.181	0.00171	69.4	0.00035	0.014	0.014	0.0915	0.003
26-Jul-2019	0.028	0.00035	0.00035	0.0013	0.00035	0.021	0.00018	0.444	0.0785	0.00035	0.001	0.106	0.00624	0.021	0.006	0.00021	0.00122	0.056	0.035	0.00035	0.139	0.00014	0.153	0.0009	69.4	0.00035	0.014	0.014	0.0478	0.003
30-Jul-2019	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00007	0.361	0.0797	0.00035	0	0.061	0.00256	0.021	0.003	0.00021	0.00131	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00075	69.4	0.00035	0.014	0.014	0.0401	0.003
22-Aug-2019	0.043	0.00035	0.001	0.0016	0.00035	0.021	0.00086	0.069	0.0751	0.00035	0.001	0.146	0.01528	0.021	0.013	0.00021	0.00139	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00089	69.4	0.00035	0.014	0.014	0.0318	0.003
27-Aug-2019	0.097	0.00035	0.00275	0.0032	0.00035	0.021	0.0005	0.236	0.0894	0.00035	0.002	0.39	0.04917	0.081	0.037	0.00021	0.00118	0.056	0.035	0.00035	0.458	0.00036	0.139	0.00099	69.4	0.00035	0.014	0.014	0.0479	0.003
28-Aug-2019	0.062	0.00035	0.00122	0.0019	0.00035	0.021	0.00026	0.139	0.0696	0.00035	0.006	0.193	0.01764	0.021	0.027	0.00021	0.00143	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00072	69.4	0.00035	0.014	0.014	0.0608	0.003
29-Aug-2019	0.032	0.00035	0.00035	0.0007	0.00035	0.021	0.00007	0.069	0.1889	0.00147	0.006	0.688	0.00253	0.021	0.072	0.00247	0.06417	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.2931	0.003
25-Sep-2019	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00021	0.069	0.0756	0.00035	0.001	0.057	0.00103	0.021	0	0.00021	0.00132	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0226	0.003
27-Sep-2019	0.014	0.00089	0.00035	0.001	0.00035	0.021	0.00007	0.069	0.0715	0.00035	0.001	0.067	0.0024	0.021	0.002	0.00021	0.00151	0.056	0.035	0.00035	0.139	0.00014	0.306	0.00071	69.4	0.00035	0.014	0.014	0.3583	0.003
23-Oct-2019	0.014	0.00035	0.00328	0.0012	0.00035	0.021	0.00007	0.069	0.0778	0.00035	0.002	0.064	0.00106	0.021	0.001	0.00021	0.00132	0.056	0.035	0.00035	0.139	0.00014	0.167	0.00035	69.4	0.00035	0.014	0.014	0.021	0.003
24-Oct-2019	0.014	0.00035	0.00447	0.0003	0.00035	0.021	0.00007	0.069	0.0717	0.00035	0.004	0.062	0.00124	0.021	0.001	0.00021	0.00147	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0325	0.003
25-Oct-2019	0.038	0.00035	0.01165	0.0013	0.00035	0.021	0.00076	0.194	0.0724	0.00035	0.007	0.104	0.04048	0.021	0.002	0.00021	0.002	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00081	69.4	0.00035	0.014	0.014	0.1029	0.003
26-Nov-2019	0.014	0.00035	0.00035	0.0013	0.00035	0.021	0.00044	0.486	0.0669	0.00035	0.001	0.062	0.00099	0.021	0.001	0.00021	0.00104	0.056	0.035	0.00035	0.139	0.00014	0.264	0.00078	69.4	0.00035	0.014	0.014	0.0892	0.003
27-Nov-2019	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00047	0.403	0.065	0.00035	0.001	0.075	0.002	0.021	0.005	0.00021	0.00097	0.056	0.035	0.00035	0.139	0.00014	0.153	0.00035	69.4	0.00035	0.014	0.014	0.0646	0.003
28-Nov-2019	0.014	0.00035	0.00035	0.001	0.00035	0.021	0.00028	0.486	0.0521	0.00035	0.001	0.044	0.00076	0.021	0.001	0.00021	0.00108	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00081	69.4	0.00035	0.014	0.014	0.0511	0.003
24-Dec-2019	0.029	0.00035	0.00035	0.0015	0.00035	0.021	0.00007	0.431	0.0508	0.00035	0.001	0.049	0.00118	0.021	0.001	0.00021	0.00147	0.056	0.035	0.00035	0.139	0.00014	0.222	0.00086	69.4	0.00035	0.014	0.014	0.0746	0.003
25-Dec-2019	0.014	0.00035	0.00035	0.0011	0.00035	0.021	0.00017	0.417	0.065	0.00035	0.001	0.054	0.00258	0.021	0.003	0.00021	0.00186	0.056	0.035	0.00035	0.139	0.00014	0.208	0.00076	69.4	0.00035	0.014	0.014	0.0807	0.003
27-Dec-2019	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00035	0.319	0.0578	0.00035	0.001	0.049	0.00228	0.071	0.002	0.00021	0.00179	0.056	0.035	0.00035	0.292	0.00014	0.347	0.00101	69.4	0.00035	0.014	0.014	0.0676	0.003
30-Jan-2020	0.014	0.00035	0.00035	0.0008	0.00035	0.021	0.00007	0.431	0.0461	0.00035	0.003	0.071	0.00331	0.021	0.002	0.00047	0.00101	0.056	0.035	0.00035	0.361	-	0.222	0.00035	69.4	0.00035	0.014	0.014	0.0487	0.003
31-Jan-2020	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00108	0.403	0.0647	0.00035	0.002	0.069	0.00147	0.021	0.002	0.00057	0.00099	0.056	0.035	0.00035	0.139	-	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0239	0.003
21-Feb-2020	0.029	0.00035	0.00035	0.0011	0.00035	0.021	0.00019	0.444	0.0594	0.00035	0.002	0.239	0.00142	0.021	0.003	0.00021	0.00129	0.056	0.035	0.00035	0.139	0.00014	0.167	0.00083	69.4	0.00035	0.014	0.014</		

ATTACHMENT A4
METAL CONCENTRATIONS (24-HOUR), TSP-2, AUG. 2012 – DEC. 2021

Sample Date	Aluminum (Al), µg/m³	Antimony (Sb), µg/m³	Arsenic (As), µg/m³	Barium (Ba), µg/m³	Beryllium (Be), µg/m³	Boron (B), µg/m³	Cadmium (Cd), µg/m³	Calcium (Ca), µg/m³	Chromium (Cr), µg/m³	Cobalt (Co), µg/m³	Copper (Cu), µg/m³	Iron (Fe), µg/m³	Lead (Pb), µg/m³	Magnesium (Mg), µg/m³	Manganese (Mn), µg/m³	Molybdenum (Mo), µg/m³	Nickel (Ni), µg/m³	Phosphorus (P), µg/m³	Potassium (K), µg/m³	Selenium (Se), µg/m³	Silicon (Si), µg/m³	Silver (Ag), µg/m³	Sodium (Na), µg/m³	Strontium (Sr), µg/m³	Sulphur (S), µg/m³	Tin (Sn), µg/m³	Titanium (Ti), µg/m³	Vanadium (V), µg/m³	Zinc (Zn), µg/m³	Zirconium (Zr), µg/m³
Ontario AAQC (24-hr avg)		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	2			10		1		120		10	120	2	120	
01-Jan-2021	0.014	0.00035	0.00035	0.0042	0.00035	0.021	0.00007	0.375	0.1168	0.00035	0.002	0.065	0.00035	0.021	0.002	0.00021	0.00167	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00079	69.4	0.00035	0.014	0.014	0.0543	0.003
02-Jan-2021	0.014	0.00035	0.00035	0.0035	0.00035	0.021	0.00005	0.361	0.1076	0.00035	0.002	0.062	0.006	0.021	0.004	0.00021	0.001	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00072	0.014	0.014	0.0696	0.003
03-Jan-2021	0.014	0.00096	0.001	0.0085	0.00035	0.021	0.00144	0.403	0.0919	0.00035	0.004	0.129	0.08556	0.06	0.017	0.00062	0.00096	0.056	0.035	0.00035	0.139	0.00082	0.069	0.00115	69.4	0.00035	0.014	0.014	0.1958	0.003
04-Feb-2021	0.014	0.0011	0.0011	0.0008	0.00035	0.021	0.00075	0.069	0.1224	0.00035	0.001	0.119	0.11264	0.021	0.015	0.00021	0.001	0.056	0.069	0.00035	0.139	0.00106	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0421	0.003
05-Feb-2021	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00007	0.069	0.0944	0.00035	0.001	0.058	0.00342	0.021	0.001	0.00021	0.00056	0.056	0.071	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0078	0.003
06-Feb-2021	0.029	0.00035	0.00035	0.0008	0.00035	0.021	0.00019	0.069	0.0849	0.00035	0.001	0.075	0.00418	0.021	0.006	0.00021	0.0029	0.056	0.079	0.00035	0.139	0.00014	0.069	0.00071	69.4	0.00035	0.014	0.014	0.0112	0.003
15-Mar-2021	0.014	0.00035	0.00035	0.0025	0.00035	0.021	0.00007	0.347	0.0594	0.00035	0.002	0.043	0.00193	0.021	0.001	0.00021	0.00099	0.056	0.035	0.00035	0.139	0.00014	0.139	0.00089	69.4	0.01667	0.014	0.014	0.0475	0.003
18-Mar-2021	0.028	0.00035	0.00035	0.0022	0.00035	0.021	0.00007	0.375	0.0706	0.00035	0.001	0.021	0.00201	0.021	0.001	0.00021	0.00111	0.056	0.035	0.00035	0.139	0.00014	0.153	0.00076	69.4	0.00035	0.014	0.014	0.0394	0.003
19-Mar-2021	0.029	0.00035	0.00035	0.0026	0.00035	0.021	0.0004	0.444	0.0581	0.00035	0.002	0.078	0.02028	0.044	0.016	0.00021	0.00108	0.056	0.035	0.00035	0.139	0.00014	0.194	0.00107	69.4	0.00035	0.014	0.014	0.0553	0.003
01-Apr-2021	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00007	0.347	0.0699	0.00035	0.001	0.049	0.00099	0.021	0.001	0.00021	0.0014	0.056	0.035	0.00035	0.139	0.00014	0.153	0.00071	69.4	0.00035	0.014	0.014	0.0124	0.003
02-Apr-2021	0.036	0.00125	0.0011	0.0011	0.00035	0.021	0.00074	0.444	0.0658	0.00035	0.003	0.142	0.12764	0.043	0.016	0.00021	0.00186	0.056	0.035	0.00035	0.139	0.00147	0.139	0.00114	69.4	0.00035	0.014	0.014	0.0568	0.003
03-Apr-2021	0.072	0.00146	0.00157	0.0014	0.00035	0.021	0.00078	0.431	0.0421	0.00035	0.01	0.19	0.13347	0.05	0.022	0.00021	0.00165	0.056	0.035	0.00035	0.139	0.00158	0.069	0.00128	69.4	0.00035	0.014	0.014	0.0754	0.003
15-May-2021	0.036	0.0056	0.00106	0.0008	0.00035	0.021	0.00044	0.069	0.0828	0.00035	0.002	0.106	0.06139	0.021	0.008	0.00021	0.00129	0.056	0.035	0.00035	0.139	0.00064	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0242	0.003
17-May-2021	0.053	0.00035	0.00035	0.0014	0.00035	0.021	0.00026	0.153	0.0726	0.00035	0.002	0.151	0.04583	0.021	0.008	0.00021	0.00114	0.056	0.035	0.00035	0.139	0.0004	0.069	0.00085	69.4	0.00035	0.014	0.014	0.0183	0.003
19-May-2021	0.014	0.00035	0.00035	0.0003	0.00035	0.021	0.00007	0.069	0.0736	0.00035	0.001	0.053	0.00221	0.021	0.001	0.00021	0.00169	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0035	0.003
01-Jun-2021	0.031	0.00035	0.00035	0.0012	0.00035	0.021	0.00182	0.514	0.0625	0.00035	0.002	0.137	0.02153	0.044	0.006	0.00021	0.00138	0.056	0.035	0.00035	0.472	0.00014	0.069	0.00086	69.4	0.00035	0.014	0.014	0.0208	0.003
02-Jun-2021	0.051	0.00035	0.00133	0.0016	0.00035	0.021	0.00049	0.472	0.0943	0.00035	0.002	0.176	0.05042	0.05	0.014	0.00021	0.00232	0.056	0.035	0.00035	0.736	0.0006	0.139	0.00104	69.4	0.00035	0.014	0.014	0.0424	0.003
07-Jun-2021	0.175	0.00181	0.00533	0.0047	0.00035	0.021	0.00182	0.917	0.1064	0.00035	0.005	0.642	0.20556	0.158	0.077	0.00021	0.00281	0.056	0.035	0.00035	0.569	0.00185	0.208	0.002	69.4	0.00035	0.014	0.014	0.1389	0.003
27-Dec-2021	0.032	0.00035	0.00035	0.0012	0.00035	0.021	0.00021	0.458	0.0696	0.00035	0.003	0.081	0.02319	0.021	0.007	0.00021	0.00164	0.056	0.035	0.00035	0.139	0.00014	0.153	0.0009	69.4	0.00035	0.014	0.014	0.0572	0.003
28-Dec-2021	0.053	0.00035	0.00035	0.0009	0.00035	0.021	0.00029	0.361	0.0885	0.00035	0.003	0.069	0.01597	0.021	0.006	0.00021	0.00133	0.056	0.035	0.00035	0.139	0.00051	0.194	0.00081	69.4	0.00035	0.014	0.014	0.0451	0.003
30-Dec-2021	0.014	0.00035	0.00035	0.001	0.00035	0.021	0.00017	0.292	0.0551	0.00035	0.003	0.05	0.01285	0.021	0.002	0.00021	0.00207	0.056	0.035	0.00035	0.139	0.00036	0.208	0.00035	69.4	0.00035	0.014	0.014	0.0396	0.003

ATTACHMENT A5

METAL CONCENTRATIONS (24-HOUR), TSP-3, DEC. 2014 – DEC. 2021

ATTACHMENT A5
METAL CONCENTRATIONS (24-HOUR), TSP-3, DEC. 2014 - DEC. 2021

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zincium (Zr), total µg/m³
Ontario AQIC (24-hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	0.4	120	2					10		1		120		10	120	2	120		
12-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.306	0.0958	0.03472	0.035	0.367	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.472	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
13-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0972	0.03472	0.035	0.315	0.05556	0.021	0.0021	0.03472	0.03472	0.208	0.694	0.03472	1.097	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
14-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.1028	0.03472	0.035	0.272	0.05556	0.021	0.014	0.03472	0.03472	0.208	0.694	0.03472	0.611	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
15-Dec-2014	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0986	0.03472	0.035	0.339	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	1.569	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
12-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0806	0.03472	0.035	0.351	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
15-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0628	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
16-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0764	0.03472	0.035	0.065	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.569	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
18-Jan-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0611	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
12-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0597	0.03472	0.035	0.043	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
15-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.064	0.01389	0.431	0.0903	0.03472	0.035	0.325	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.542	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
16-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.306	0.0681	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
18-Feb-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.292	0.1306	0.03472	0.035	0.046	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.972	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
06-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0569	0.03472	0.035	0.054	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
07-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0569	0.03472	0.035	0.147	0.05556	0.050	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
16-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0542	0.03472	0.035	0.054	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.472	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
17-Mar-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0556	0.03472	0.035	0.062	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.833	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
02-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0972	0.03472	0.035	0.317	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
03-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.1014	0.03472	0.035	0.289	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
04-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0944	0.03472	0.035	0.332	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
05-Apr-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.1181	0.03472	0.035	0.433	0.05556	0.021	0.024	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
21-May-2015	2.583	0.13889	0.05556	0.0021	0.00556	0.218	0.01389	6.417	0.0208	0.03472	0.035	0.247	0.05556	0.510	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.15139	0.1	0.05556	0.014	0.021	0.0514	0.035
22-May-2015	2.097	0.13889	0.05556	0.0021	0.00556	0.165	0.01389	5.083	0.0208	0.03472	0.035	0.238	0.05556	0.421	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.12014	0.1	0.05556	0.014	0.021	0.0403	0.035
23-May-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0500	0.03472	0.035	0.274	0.05556	0.071	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0139	0.035
24-May-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.417	0.0500	0.03472	0.035	0.322	0.05556	0.106	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.4	0.05556	0.014	0.021	0.0139	0.035
16-Jun-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0472	0.03472	0.035	0.214	0.05556	0.075	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
17-Jun-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.333	0.0486	0.03472	0.035	0.228	0.05556	0.082	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0139	0.035
18-Jun-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.306	0.0569	0.03472	0.035	0.157	0.05556	0.049	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
01-Jul-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0597	0.03472	0.035	0.128	0.05556	0.057	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.3	0.05556	0.014	0.021	0.0139	0.035
08-Jul-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0528	0.03472	0.035	0.082	0.05556	0.050	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
11-Jul-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0208	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
20-Jul-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0417	0.03472	0.035	0.254	0.05556	0.071	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
14-Aug-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0514	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.472	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
15-Aug-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0431	0.03472	0.035	0.119	0.05556	0.047	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
16-Aug-2015	0.139	0.13889	0.05556	0.0021	0.00556	0.021	0.01389	0.319	0.0417	0.03472	0.035	0.311	0.05556	0.060	0.070	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208						

ATTACHMENT A5
METAL CONCENTRATIONS (24-HOUR), TSP-3, DEC. 2014 - DEC. 2021

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zincium (Zr), total µg/m³
Ontario AQC (24-hr avg)	25	0.3	10	0.01	120	0.025		0.5	0.1	50	0.4	0.5		0.4	120	2			10		1		120		10	120	2	120		
26-Nov-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1167	0.03472	0.035	0.044	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00417	0.1	0.05556	0.014	0.021	0.0139	0.035
27-Nov-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0875	0.03472	0.035	0.051	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00625	0.1	0.05556	0.014	0.021	0.0139	0.035
28-Nov-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0778	0.03472	0.035	0.104	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.01042	0.1	0.05556	0.014	0.021	0.0139	0.035
27-Dec-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0931	0.03472	0.035	0.071	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
29-Dec-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1111	0.03472	0.035	0.068	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00418	0.1	0.05556	0.014	0.021	0.0139	0.035
30-Dec-2016	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1181	0.03472	0.035	0.089	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00528	0.1	0.05556	0.014	0.021	0.0139	0.035
28-Jan-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0861	0.03472	0.035	0.072	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00458	0.1	0.05556	0.014	0.021	0.0139	0.035
29-Jan-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0764	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00556	0.1	0.05556	0.014	0.021	0.0139	0.035
30-Jan-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0889	0.03472	0.035	0.021	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00486	0.1	0.05556	0.014	0.021	0.0139	0.035
18-Feb-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0778	0.03472	0.035	0.085	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00528	0.1	0.05556	0.014	0.021	0.0139	0.035
19-Feb-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0750	0.03472	0.035	0.153	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00764	0.1	0.05556	0.014	0.021	0.0139	0.035
20-Feb-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0972	0.03472	0.035	0.129	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00764	0.1	0.05556	0.014	0.021	0.0139	0.035
15-Jun-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0889	0.03472	0.035	0.075	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
16-Jun-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0847	0.03472	0.035	0.082	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
20-Jun-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1319	0.03472	0.035	0.247	0.05556	0.047	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
18-Jul-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0819	0.03472	0.035	0.068	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
20-Jul-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0903	0.03472	0.035	0.068	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
21-Jul-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0917	0.03472	0.035	0.057	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
02-Aug-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0708	0.03472	0.035	0.139	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
08-Aug-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1583	0.03472	0.035	0.192	0.05556	0.021	0.012	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
06-Aug-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1167	0.03472	0.035	0.232	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
20-Sep-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0972	0.03472	0.035	0.069	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
26-Sep-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0764	0.03472	0.035	0.042	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
29-Sep-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1458	0.03472	0.035	0.074	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
03-Oct-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1431	0.03472	0.035	0.125	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
05-Oct-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1306	0.03472	0.035	0.072	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
06-Oct-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.1153	0.03472	0.035	0.067	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
30-Nov-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0889	0.03472	0.035	0.047	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
05-Dec-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0792	0.03472	0.035	0.060	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
07-Dec-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0847	0.03472	0.035	0.071	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
12-Dec-2017	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0792	0.03472	0.035	0.082	0.05556	0.046	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
31-Jan-2018	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0792	0.03472	0.035	0.044	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
07-Feb-2018	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0764	0.03472	0.035	0.061	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208	0.1	0.05556	0.014	0.021	0.0139	0.035
10-Feb-2018	0.139	0.13889	0.05556	0.0021	0.05556	0.021	0.01389	0.139	0.0875	0.03472	0.035	0.068	0.05556	0.021	0.006	0.03472	0.03472	0.208	0.694	0.03472	0.208	0.02083	0.208	0.00208						

ATTACHMENT A5
METAL CONCENTRATIONS (24-HOUR), TSP-3, DEC. 2014 - DEC. 2021

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zincium (Zr), total µg/m³	
Ontario AQC (24-hr avg)	25	0.3	10	0.01	120	0.025	0.5	0.1	50	4	0.5	10	0.025	0.4	120	2	10	1	120	10	120	2	120	10	120	2	120	10	120	2	120
24-Apr-2019	0.014	0.00035	0.00035	0.00022	0.00035	0.021	0.00007	0.514	0.0646	0.00035	0.000	0.068	0.00099	0.021	0.005	0.00053	0.00186	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00094	69.4	0.00035	0.014	0.014	0.1279	0.003	
30-Apr-2019	0.036	0.00035	0.00035	0.00018	0.00035	0.021	0.00014	0.528	0.0631	0.00035	0.000	0.064	0.00125	0.050	0.003	0.00043	0.00085	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00093	69.4	0.00035	0.014	0.014	0.1265	0.003	
01-May-2019	0.036	0.00035	0.00035	0.00034	0.00035	0.021	0.00015	0.069	0.0668	0.00035	0.001	0.064	0.00035	0.021	0.001	0.00021	0.00106	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00079	69.4	0.00035	0.014	0.014	0.0035	0.003	
08-May-2019	0.049	0.00035	0.00035	0.00014	0.00035	0.021	0.00028	0.139	0.0769	0.00035	0.001	0.089	0.00083	0.021	0.002	0.00021	0.00106	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00083	69.4	0.00035	0.014	0.014	0.0076	0.003	
09-May-2019	0.040	0.00035	0.00035	0.00009	0.00035	0.021	0.00007	0.139	0.0771	0.00035	0.001	0.062	0.00071	0.021	0.002	0.00021	0.00104	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0035	0.003	
29-Jun-2019	0.060	0.00035	0.00035	0.00022	0.00035	0.021	0.00146	0.472	0.0808	0.00035	0.002	0.124	0.00183	0.047	0.005	0.00042	0.00239	0.056	0.207	0.00035	0.139	0.00014	0.361	0.00107	69.4	0.00035	0.014	0.014	0.0560	0.003	
21-Jul-2019	0.014	0.00035	0.00035	0.00021	0.00035	0.021	0.00051	0.486	0.0793	0.00035	0.001	0.089	0.00161	0.044	0.006	0.00104	0.00174	0.056	0.110	0.00035	0.139	0.00014	0.139	0.00079	69.4	0.00035	0.014	0.014	0.0569	0.003	
30-Jul-2019	0.014	0.00035	0.00035	0.00008	0.00035	0.021	0.00007	0.347	0.0747	0.00035	0.001	0.021	0.00035	0.021	0.000	0.00021	0.00142	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00075	69.4	0.00035	0.014	0.014	0.0756	0.003	
31-Jul-2019	0.014	0.00035	0.00035	0.00011	0.00035	0.021	0.00007	0.444	0.0935	0.00035	0.001	0.060	0.00086	0.021	0.001	0.00021	0.00124	0.056	0.035	0.00035	0.139	0.00014	0.208	0.00035	69.4	0.00035	0.014	0.014	0.0511	0.003	
22-Aug-2019	0.039	0.00035	0.00035	0.00013	0.00035	0.021	0.00007	0.194	0.0901	0.00035	0.001	0.090	0.00175	0.021	0.001	0.00021	0.00150	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00083	69.4	0.00035	0.014	0.014	0.0228	0.003	
27-Aug-2019	0.050	0.00035	0.00035	0.00016	0.00035	0.021	0.00018	0.069	0.0746	0.00035	0.001	0.104	0.00139	0.021	0.002	0.00021	0.00162	0.056	0.035	0.00035	0.139	0.00014	0.181	0.00035	69.4	0.00035	0.014	0.014	0.0226	0.003	
30-Aug-2019	0.064	0.00035	0.00035	0.00017	0.00035	0.021	0.00017	0.069	0.0865	0.00035	0.002	0.125	0.00379	0.021	0.004	0.00021	0.00132	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0283	0.003	
24-Sep-2019	0.014	0.00035	0.00035	0.00003	0.00035	0.021	0.00018	0.069	0.0665	0.00035	0.001	0.043	0.00076	0.021	0.000	0.00021	0.00146	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0228	0.003	
25-Sep-2019	0.014	0.00035	0.00035	0.00003	0.00035	0.021	0.00014	0.069	0.0750	0.00035	0.001	0.071	0.00215	0.021	0.002	0.00021	0.00157	0.056	0.035	0.00035	0.139	0.00014	0.139	0.00035	69.4	0.00035	0.014	0.014	0.0226	0.003	
27-Sep-2019	0.036	0.00035	0.00088	0.0011	0.00035	0.021	0.00019	0.069	0.0599	0.00035	0.001	0.088	0.00157	0.021	0.002	0.00021	0.00101	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0262	0.003	
24-Oct-2019	0.032	0.00035	0.00017	0.0012	0.00035	0.021	0.00007	0.069	0.0722	0.00035	0.007	0.060	0.00035	0.021	0.001	0.00021	0.00129	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.3500	0.003	
25-Oct-2019	0.033	0.00035	0.00065	0.00003	0.00035	0.021	0.00007	0.069	0.0785	0.00035	0.004	0.060	0.00468	0.021	0.002	0.00021	0.00122	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0469	0.003	
29-Oct-2019	0.028	0.00035	0.00768	0.0007	0.00035	0.021	0.00007	0.069	0.0779	0.00035	0.004	0.054	0.00074	0.021	0.002	0.00021	0.00167	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.1299	0.003	
27-Nov-2019	0.014	0.00035	0.00035	0.00009	0.00035	0.021	0.00021	0.417	0.0640	0.00035	0.002	0.043	0.00035	0.021	0.000	0.00042	0.00107	0.056	0.035	0.00035	0.139	0.00014	0.194	0.00086	69.4	0.00035	0.014	0.014	0.0462	0.003	
29-Nov-2019	0.014	0.00035	0.00035	0.0010	0.00035	0.021	0.00051	0.458	0.0482	0.00035	0.003	0.060	0.00035	0.021	0.001	0.00062	0.00085	0.056	0.035	0.00035	0.139	0.00014	0.139	0.00035	69.4	0.00035	0.014	0.014	0.0462	0.003	
24-Dec-2019	0.036	0.00035	0.00035	0.00014	0.00035	0.021	0.01286	0.514	0.0525	0.00035	0.002	0.076	0.00222	0.021	0.004	0.00021	0.00267	0.056	0.035	0.00035	0.444	0.00014	0.167	0.00072	69.4	0.00035	0.014	0.014	0.0761	0.003	
25-Dec-2019	0.040	0.00035	0.00035	0.00012	0.00035	0.021	0.00028	0.403	0.0569	0.00035	0.002	0.075	0.00200	0.021	0.002	0.00021	0.00235	0.056	0.035	0.00035	0.431	0.00014	0.139	0.00075	69.4	0.00035	0.014	0.014	0.0654	0.003	
27-Dec-2019	0.014	0.00035	0.00035	0.00011	0.00035	0.021	0.00076	0.444	0.0654	0.00035	0.001	0.021	0.00035	0.050	0.001	0.00021	0.00108	0.056	0.035	0.00035	0.403	0.00014	0.194	0.00090	69.4	0.00035	0.014	0.014	0.0643	0.003	
21-Feb-2020	0.014	0.00035	0.00035	0.00011	0.00035	0.021	0.00007	0.458	0.0882	0.00035	0.002	0.074	0.00097	0.021	0.001	0.00021	0.00167	0.056	0.035	0.00035	0.139	0.00014	0.250	0.00075	69.4	0.00035	0.014	0.014	0.0400	0.003	
25-Feb-2020	0.014	0.00035	0.00035	0.00003	0.00035	0.021	0.00007	0.264	0.0843	0.00035	0.001	0.053	0.00035	0.021	0.001	0.00021	0.00139	0.056	0.035	0.00035	0.542	0.00014	0.250	0.00035	69.4	0.00035	0.014	0.014	0.0246	0.003	
26-Feb-2020	0.028	0.00035	0.00035	0.00009	0.00035	0.021	0.00042	0.069	0.0818	0.00035	0.001	0.062	0.00035	0.021	0.001	0.00021	0.00111	0.056	0.035	0.00035	0.139	0.00014	0.069	0.00035	69.4	0.00035	0.014	0.014	0.0261	0.003	
26-Mar-2020	0.014	0.00035	0.00035	0.00014	0.00035	0.021	0.00053	0.417	0.0661	0.00035	0.001	0.068	0.00035	0.060	0.001	0.00021	0.00101	0.056	0.035	0.00035	0.139	0.00014	0.278	0.00099	69.4	0.00035	0.014	0.014	0.1708	0.003	
31-Mar-2020	0.033	0.00035	0.00035	0.00013	0.00035	0.021	0.00007	0.375	0.0543	0.00035	0.001	0.069	0.00181	0.044	0.002	0.00021	0.00121	0.056	0.035	0.00035	0.139	0.00014	0.194	0.00082	69.4	0.00035	0.014	0.014	0.0858	0.003	
24-Apr-2020	0.033	0.00035	0.00035	0.00014	0.00035	0.021	0.00015	0.417	0.0789	0.00035	0.001	0.075	0.00128	0.021	0.001	0.00021	0.00103	0.056	0.035	0.00035	0.139	0.00014	0.181	0.00100	69.4	0.00035	0.014	0.014	0.2125	0.003	
29-Apr-2020	0.054	0.00035	0.00035	0.00017	0.00035	0.021	0.00017	0.528	0.0762	0.00035	0.001	0.088	0.00097	0.021	0.002	0.00043	0.00093	0.056	0.035	0.00035	0.139	0.00014	0.153	0.00132	69.4	0.00035	0.014	0.014	0.4125	0.003	
27-May-2020	0.032	0.00035	0.00035	0.00010	0.00035	0.021	0.00024	0.389	0.0781	0.00035	0.001	0.047	0.00088	0.021	0.001	0.00021	0.00119	0.056	0.075	0.00035	0.139	0.00014	0.069	0.00083	69.4	0.00035	0.014	0.014	0.0114	0.003	
29-May-2020	0.014	0.00035	0.00035	0.00008	0.00035	0.021	0.00007	0.389	0.0532	0.00035	0.001	0.047	0.00153	0.021	0.001	0.00021	0.00094	0.056	0.035	0.00035	0.347	0.00014	0.153	0.00081	69.4	0.00035	0.014	0.014	0.0035	0.003	
30-Jul-2020	0.040	0.00035	0.00035	0.00008	0.00035	0.021	0.00017	0.069	0.0635	0.00035	0.001	0.065	0.00114	0.021	0.003	0.00021	0.00126	0.056	0.112	0.00035	0.139	0.00014	0.069	0.00072	69.4	0.00035	0.014	0.014	0.0114	0.003	
26-Aug-2020	0.028	0.00035	0.00035	0.00009	0.00035	0.021	0.00007	0.069	0.0572	0.00035	0.002	0.021	0.00076	0.021	0.001																

ATTACHMENT A5
METAL CONCENTRATIONS (24-HOUR), TSP-3, DEC. 2014 – DEC. 2021

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
Ontario AAQC (24-hr avg)		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	2			10		1		120		10	120	2	120	
01-Jun-2021	0.029	0.00035	0.00035	0.001	0.00035	0.021	0.00022	0.486	0.081	0.00035	0.001	0.064	0.00187	0.021	0.001	0.00021	0.00221	0.056	0.035	0.00035	0.139	0.00014	0.139	0.00092	69.4	0.00035	0.014	0.014	0.0236	0.003
02-Jun-2021	0.014	0.00035	0.00035	0.0009	0.00035	0.021	0.00007	0.417	0.1076	0.00035	0	0.054	0.00212	0.021	0.002	0.00021	0.00136	0.056	0.035	0.00035	0.139	0.00014	0.069	0.0009	69.4	0.00035	0.014	0.014	0.0114	0.003
07-Jun-2021	0.032	0.00035	0.00035	0.0011	0.00035	0.021	0.00007	0.444	0.099	0.00035	0.001	0.081	0.00656	0.021	0.003	0.00049	0.00081	0.056	0.035	0.00035	0.139	0.00014	0.167	0.00093	69.4	0.00035	0.014	0.014	0.0238	0.003
27-Dec-2021	0.043	0.00035	0.00035	0.0012	0.00035	0.021	0.00026	0.403	0.0694	0.00035	0.005	0.065	0.00389	0.021	0.002	0.00021	0.00125	0.056	0.035	0.00035	0.139	0.00014	0.194	0.00015	69.4	0.00078	0.014	0.014	0.0133	0.003
28-Dec-2021	0.119	0.00035	0.00035	0.0012	0.00035	0.021	0.00015	0.528	0.0633	0.00035	0.004	0.065	0.00539	0.046	0.002	0.00021	0.00149	0.056	0.035	0.00035	0.139	0.00014	0.208	0.00099	69.4	0.00162	0.014	0.014	0.016	0.003
30-Dec-2021	0.05	0.00035	0.00035	0.001	0.00035	0.021	0.00017	0.403	0.0744	0.00035	0.002	0.05	0.002	0.044	0.001	0.00021	0.00101	0.056	0.035	0.00035	0.139	0.00014	0.236	0.00083	69.4	0.00035	0.014	0.014	0.0087	0.003

ATTACHMENT B

STATISTICAL TESTS RESULTS

Table B-1: Non-parametric (Kruskal-Wallis) Test Results for Dust Metals Data for 2021

Parameter	Non-parametric	Median	
	Mann-Whitney p-value	TSP-2	TSP-3
Al	0.551428	0.029000	0.032000
Sb	0.317833	0.000350	0.00035
As	0.023966	0.00035	0.00035
Ba	0.733187	0.001200	.001100
Be	1.00000	0.00035	0.00035
B	1.000000	0.021	0.021
Cd	0.188794	0.0002900	0.00019
Ca	0.694093	0.36100	.36100
Cr	0.743619	0.073600	.074900
Co	1.000000	0.00035	0.00035
Cu	0.063348	0.002	0.001
Fe	0.190192	0.07800	.06500
Pb	0.010671	0.0202800	.0027900
Mg	0.439140	0.021	0.021
Mn	0.011925	0.00600	.00200
Mo	0.972813	0.00021	0.00021
Ni	0.811091	0.0014000	.0014700
P	1.000000	0.056	0.056
K	0.852443	0.035	0.035
Se	1.000000	0.00035	0.00035
Si	0.451755	0.139	0.139
Ag	0.004987	0.00014	0.00014
Na	0.145489	0.069	0.139
Sr	0.829060	0.00082	0.00089
S	1.000000	69.4	69.4
Sn	0.408419	0.00035	0.00035
Ti	1.000000	0.014	0.014
V	1.000000	0.014	0.014
Zn	0.076102	0.04225	0.0232
Zr	1.000000	0.003	0.003

Bold values $p < 0.05$

Table B-2: Non-parametric (Kruskal-Wallis) Test Results for Dust Metals Data for 2012 through 2021

Parameter	Non-parametric	Median		
	Kruskal-Wallis p-value	TSP-1	TSP-2	TSP-3
Al	0.000156	0.139	0.139	0.139
Sb	0.000208	0.13889	0.13889	0.13889
As	0.000069	0.05556	0.05556	0.05556
Ba	0.017488	0.0021	0.0021	0.0021
Be	0.000203	0.00556	0.00556	0.00556
B	0.437715	0.021	0.021	0.021
Cd	0.000232	0.01389	0.01389	0.01389
Ca	0.341377	0.139	0.139	0.139
Cr	0.594856	0.075	0.07750	0.07640
Co	0.000200	0.03472	0.03472	0.03472
Cu	0.000054	0.035	0.035	0.035
Fe	1.9823E-12	0.09	0.124	0.065
Pb	8.431E-7	0.05556	0.05556	0.05556
Mg	0.036880	0.021	0.021	0.021
Mn	6.4382E-13	0.006	0.006	0.006
Mo	0.000257	0.03472	0.03472	0.03472
Ni	0.000193	0.03472	0.03472	0.03472
P	0.000282	0.208	0.208	0.208
K	0.000042	0.694	0.694	0.694
Se	0.000136	0.03472	0.03472	0.03472
Si	0.001290	0.208	0.208	0.208
Ag	0.000093	0.02083	0.02083	0.02083
Na	0.027391	0.208	0.208	0.208
Sr	0.003012	0.00208	0.00208	0.00208
S	0.003139	0.1	0.1	0.1
Sn	0.000192	0.05556	0.05556	0.05556
Ti	0.700292	0.014	0.014	0.014
V	0.000203	0.02	0.02	0.02
Zn	0.001399	0.0139	0.0139	0.0139
Zr	0.000203	0.035	0.035	0.035

Bold values $p < 0.05$