

# NAMIB LEAD & ZINC MINING

ENVIRONMENTAL COMPLIANCE REPORT



Desert landscape around Namib Lead Zinc Mining

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## 1 EXECUTIVE SUMMARY

This report was prepared to fulfil the requirement of the Environmental Management Act of 2007 in terms of compliance with Environmental Management and Mitigation requirement of Namib Lead and Zinc Mining (NLZM).

An environmental compliance audit and report is required bi-annually by law and contain Environmental compliance details and the implementation of the operation's Environmental Management Plan (EMP) for the period from July 2023 to December 2023.

The mine is currently under care and maintenance since April 2020.

## 2 OPERATIONAL DETAILS

### 2.1 HISTORY AND OWNERSHIP

The underground Mine was in operation from 1968 to 1992. The mine shaft extended to about 210m below the surface at the deepest part and a south decline as an alternative assess to the operations. North River Resources (NRR) took over the project from Kalahari Minerals in 2009 and began exploration drilling. The mine was recommissioned for the period January 2018 to April 2020. In December 2021 NRR Administrators sold the 90% shares to CL Group based in the USA.

NLZM is the holder of Exclusive Prospecting Licenses 2902 and 5075 as well as Mining License 185.

### 2.2 STATUTORY COMPLIANCE AND OTHER APPROVALS

The Mining License (ML)185 was granted on 29 May 2017 for 10 years with effect from 25 February 2016.

Environmental Clearance Certificate for ML 185, EPL 2902 and EPL 5072 is current and is expiring on 13 September 2024.

### 2.3 TITLE DETAILS

Namib Lead & Zinc Mining is the holder of one Mining License (MLs) and two Exclusive Prospecting Licences presented in Table 1.

**Table 1: Title Details**

Title holder	Title Number	Title Size (Ha)	Grant Date	Expire date	Status
Namib Lead & Zinc Mining	ML 185	545	25-Feb-16	25-Feb-27	Current
	EPL 2902	1887	19-Feb-23	08-Nov-25	Current
	EPL 5075	6226	07-May-21	06-May-23	Renewal submitted in Feb 2023

**Table 2: Licence Coordinates**

Licence	Point	Coordinates	
		Latitude	Longitude
ML185	1	S 22.51199407	E 14.74832610
	2	S 22.51186320	E 14.77399535
	3	S 22.53027762	E 14.77392304
	4	S 22.53087304	E 14.74824955
EPL5075	1	S 22.64768576	E 14.77353416
	2	S 22.63671200	E 14.73999538
	3	S 22.53119287	E 14.74360210
	4	S 22.52902350	E 14.80073024
	5	S 22.48297318	E 14.80063739
	6	S 22.49271651	E 14.81126566
	7	S 22.56710633	E 14.80887782
	8	S 22.57287008	E 14.81625268
	9	S 22.57330077	E 14.81566081
	10	S 22.57291503	E 14.81631045
	11	S 22.53108485	E 14.87376334
	12	S 22.53855238	E 14.87959191

<b>EPL2902</b>	1	S 22.48333335	E 14.71666857
	2	S 22.48333288	E 14.79999830
	3	S 22.52982341	E 14.79999609
	4	S 22.53236099	E 14.71705330

### 3 LOCATION & SURROUNDING AREAS

ML 185, EPL5075 and EPL 2902 are all situated in the Dorob National Park. The Mine is located about 30km NE from Swakopmund just west of Rössing Mountain, between Swakopmund (23km) and Arandis (34km).

A gravel road of 8km leads northwards off the B2 national road to the Mine. EPL 5075 is on the west of the Rössing Mountain with eastern boundary follows the foot slopes of the Rössing Mountains. The rest straddles the railway line and the B2 tar road.

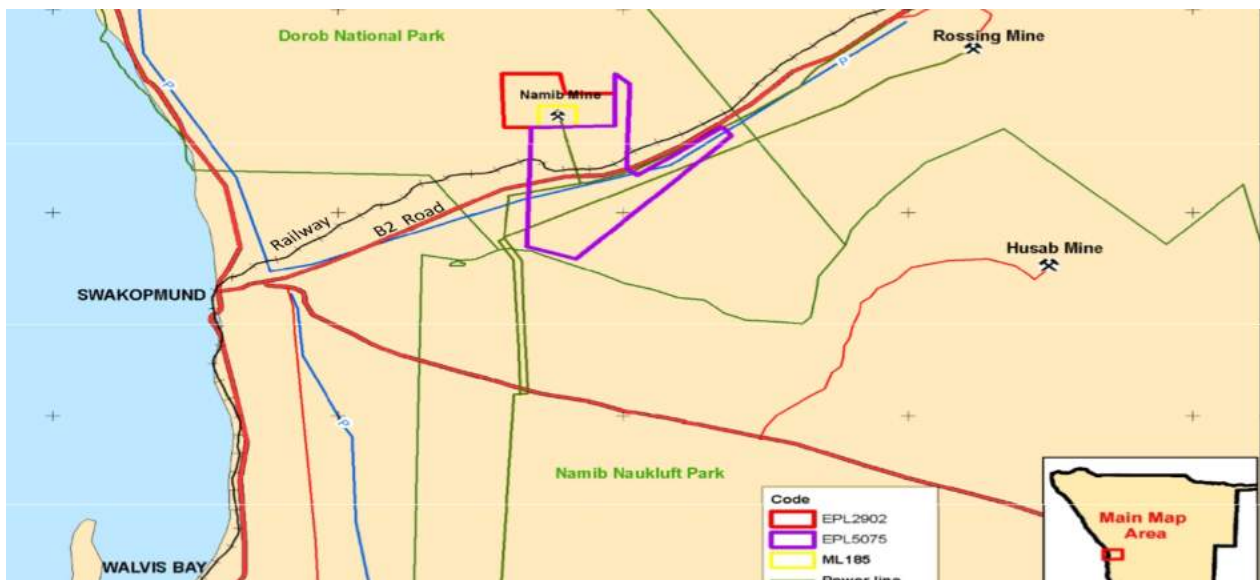


Figure 1: Locality Map of the Mine and EPLs'

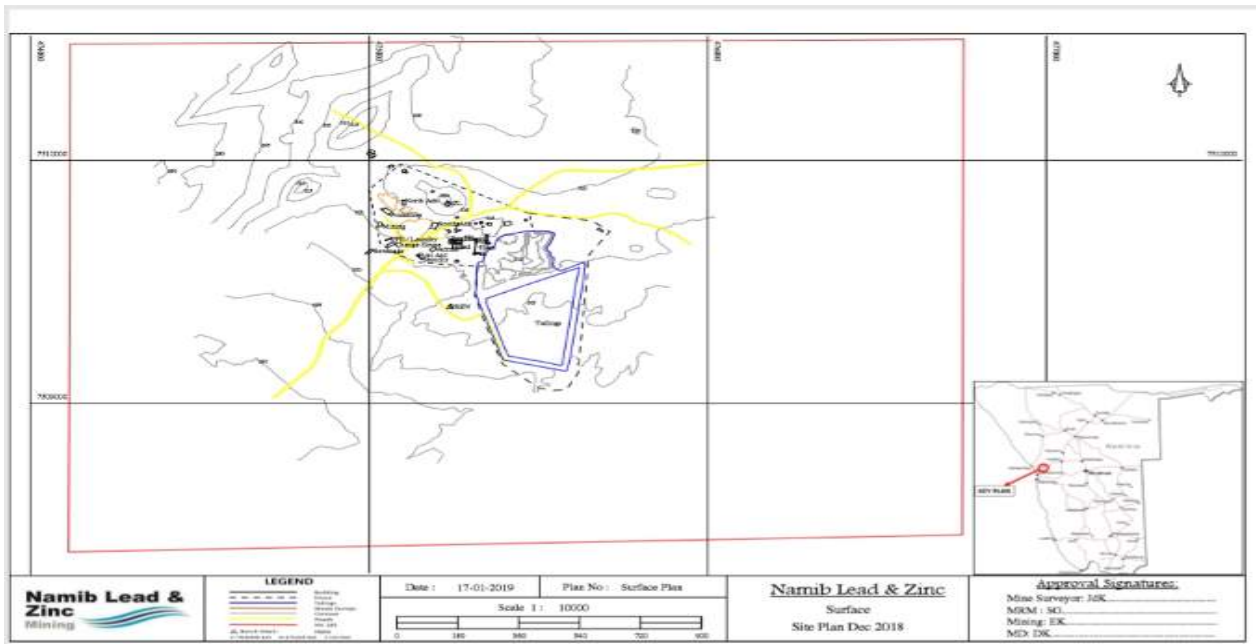


Figure 2: Mine Site Plan

## 4 METEOROLOGICAL

### 4.1 RAINFALL

The area is characterised by the extreme aridity of the Namib Desert and rainfall is so variable. It is quite common for no rain to fall in a particular year or more, while in another year the annual average can be received in a single rainfall event.

During the reporting period no rainfall was measured onsite.

### 4.2 TEMPERATURES

During the reporting period a minimum of 10°C (October) and a maximum 34°C (July) temperature were recorded onsite. The average temperature for the period was 20°C.

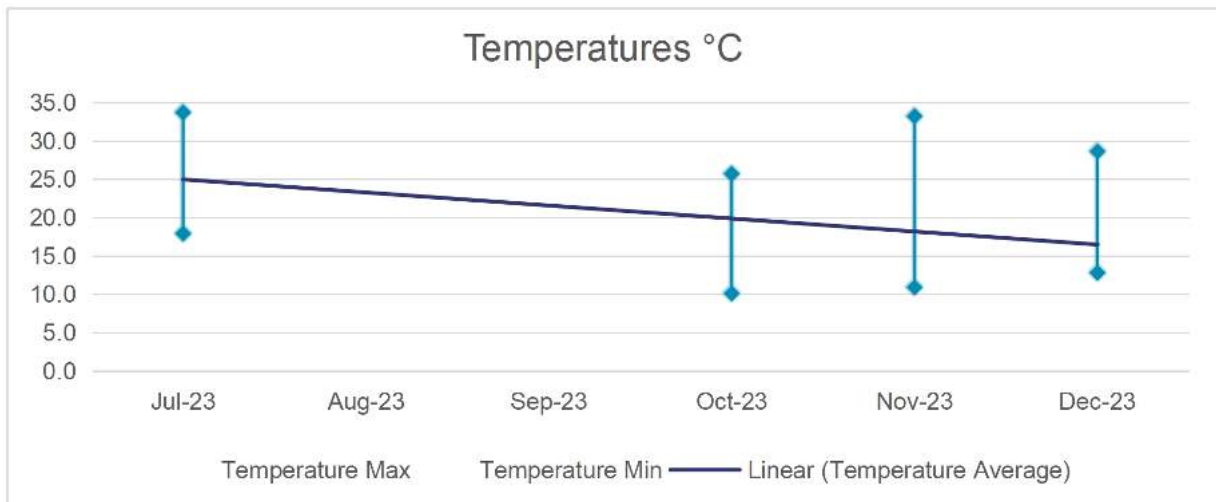


Figure 4: Temperatures

## 4.3 WIND

### 4.3.1 WIND SPEED

The highest wind speed was recorded in July (58km/h). The average wind speed for the reporting period was 11.6km/h.

Table 3: Average and maximum wind speed

Month	Jul-23	Oct-23	Nov-23	Dec-23
<b>Average</b>	16.1	11	11	13.0
<b>High</b>	58	45	45	45

### 4.3.2 WIND DIRECTION

The predominate wind direction for the reporting period was NW.

Table 4: Dominant wind direction



Month	Dominant Direction
Jul-23	E
Oct-23	WNW
Nov-23	NW
Dec-23	N

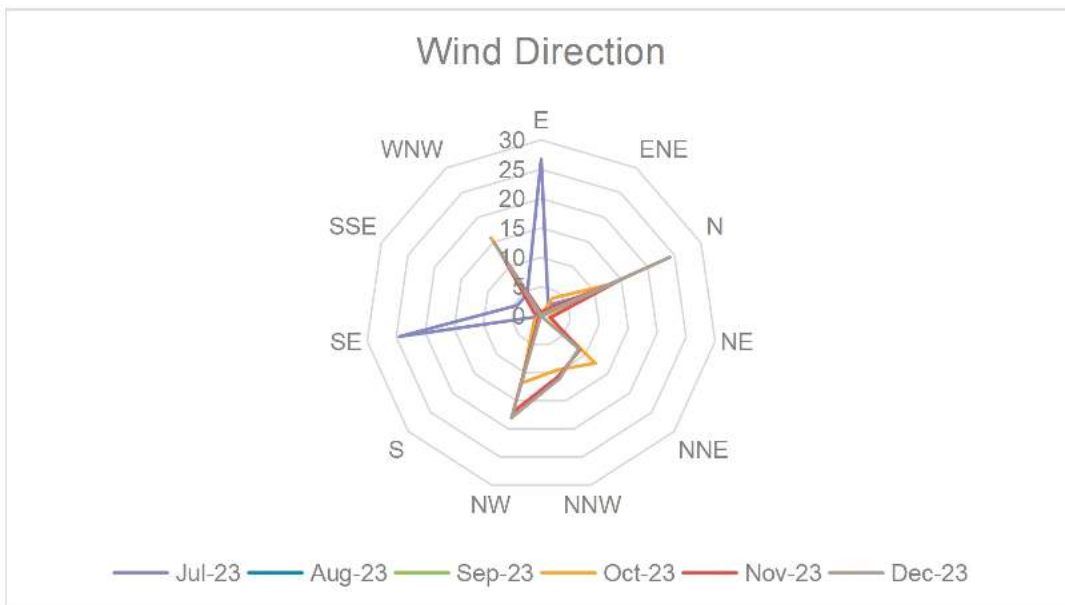


Figure 5: Wind direction

## 5 OPERATIONAL ACTIVITIES

### 5.1 EXPLORATION ACTIVITIES

The mineral resource at ML185 is well defined by exploration drilling and was computed as three-dimensional solids for volume calculations. No additional mineral exploration took place within the ML during the reporting period.

On the company’s active EPLs - EPL2902 and EPL5075 - an extensive soil sampling program was conducted during 2022 and the first semester of 2023 with geochemical analyses. The exploration work

defined several target which are planned for ground geophysical line survey for follow up to possibly define drill targets.

## 5.2 PLANT PERFORAMNCE

No processing was undertaken during the reporting period as the mine is under care and maintenance.

## 5.3 TAILINGS STORAGE FACILITY (TSF)

The TSF construction was completed, and it was in operation until C&M commenced. Details of the feasibility design and report are available.

## 5.4 APPLICABLE ENVIRONMENTAL LEGAL AND OTHER REQUIREMENTS

- Annual free park entry permit was renewed for company employees and contractors
- Environment Clearance Certificate for EPL 2902, EPL5075 and ML 185 is current.

## 5.5 ENVIRONMENTAL RISK MANAGEMENT

NLZM recognises that activities, products, and services conducted interact with the environment and as such may have an impact on the environment. To manage any impact, NLZM developed and implemented procedures which describe how to identify environmental aspects and impacts and assess the associated risks. The identified risks were captured in an Environmental Risk Assessment Register.

Risk Management is an integral part of the day-to-day operation of NLZM.

## 5.6 ENVIRONMENTAL TRAINING AND AWARENESS

No training and awareness were conducted during the reporting period.

## 5.7 ENVIRONMENTAL INCIDENT MANAGEMENT AND REPORTING

During the period under review no reportable incident and other minor incidents were recorded.

# 6 ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

## 6.1 STAKEHOLDER CONSULTATION / COMMUNICATION MANAGEMENT

The following stakeholder communication/consultation were undertaken:

- Monthly groundwater abstraction volume and boreholes water levels were submitted to the Ministry of Agriculture, Water and Land Reform.

## 6.2 BIODIVERSITY MANAGEMENT

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### 6.2.1 CATCH AND RELEASE

During the period under review no fauna was encountered in the operation area.

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### 6.2.2 REHABILITATION AND RESTORATION MANAGEMENT

All borehole sites, with exploration samples generated during the drilling around the EPLs' were cleared and rehabilitated. The holes in these areas were capped to avoid animals getting stuck and or fall within the holes.

**6.2.3 SURFACE WATER/STORM WATER MANAGEMENT**

No runoff of storm water was observed on the mine due to no rainfall was received during the period. No wastewater runoff and discharge took place.

A surface or rainwater drainage report identifying the risks and in an unlikely event of a storm is in place.

**6.2.4 GROUNDWATER MANAGEMENT**

Water levels are measured monthly and water samples are collected bi-annually for a complete chemistry analysis by a third-party external laboratory.

**6.2.4.1 GROUND WATER LEVELS**

Groundwater water levels are measured monthly. The levels in all boreholes were consistent.

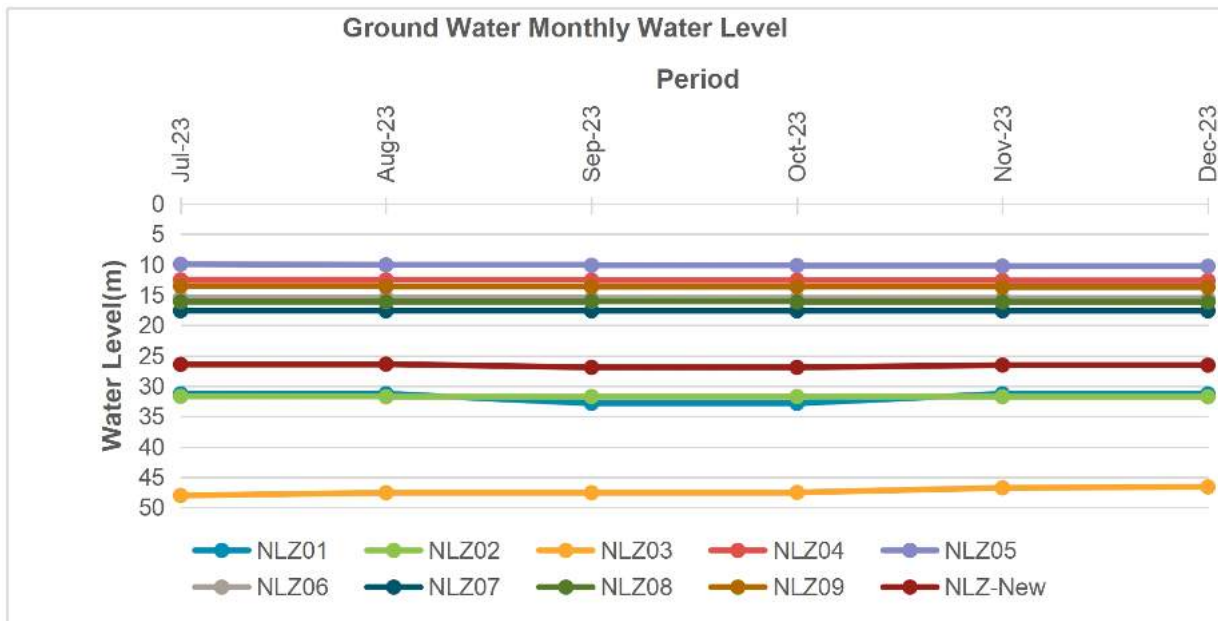


Figure 3: Monthly Groundwater Levels

**6.2.4.2 GROUND WATER QUALITY**

**6.2.4.2.1 IONS**

**6.2.4.2.1.1 PH**

pH can be used as an indicator of potential acid mine drainage reaching the aquifer.

The pH values for reporting period are within usual range. The pH ranged between 6.1 and 6.6 with an average of 6.3.

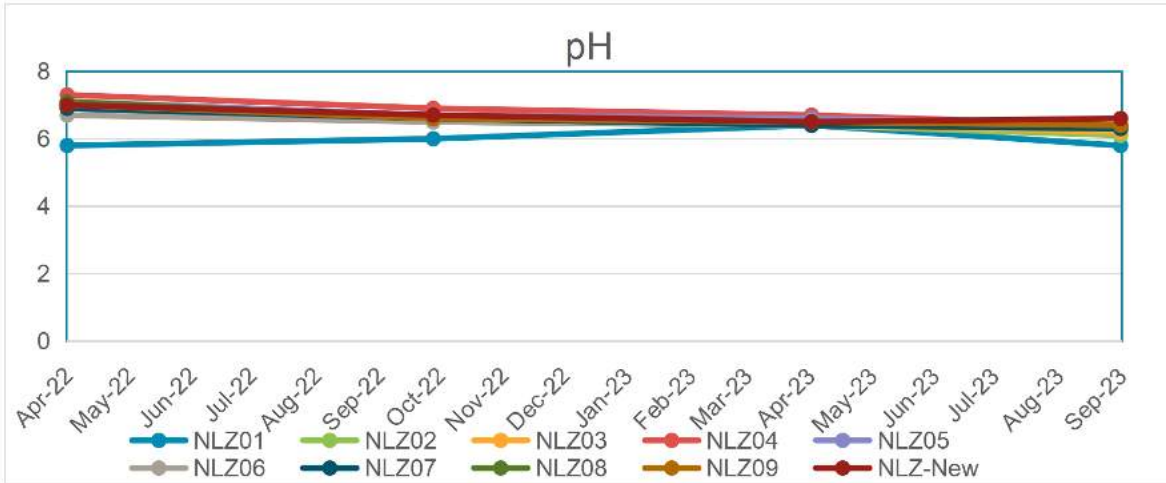


Figure 4: pH levels

#### 6.2.4.2.1.2 TOTAL DISSOLVED SOLIDS

TDS used to determine the general water quality, a sudden increase in TDS generally indicates a change in water quality. A high TDS generally indicates a long residence period of groundwater. TDS levels for the reporting period range between 10367mg/l and 26150mg/l with an average 20670 mg/l. All boreholes are within the usual levels.

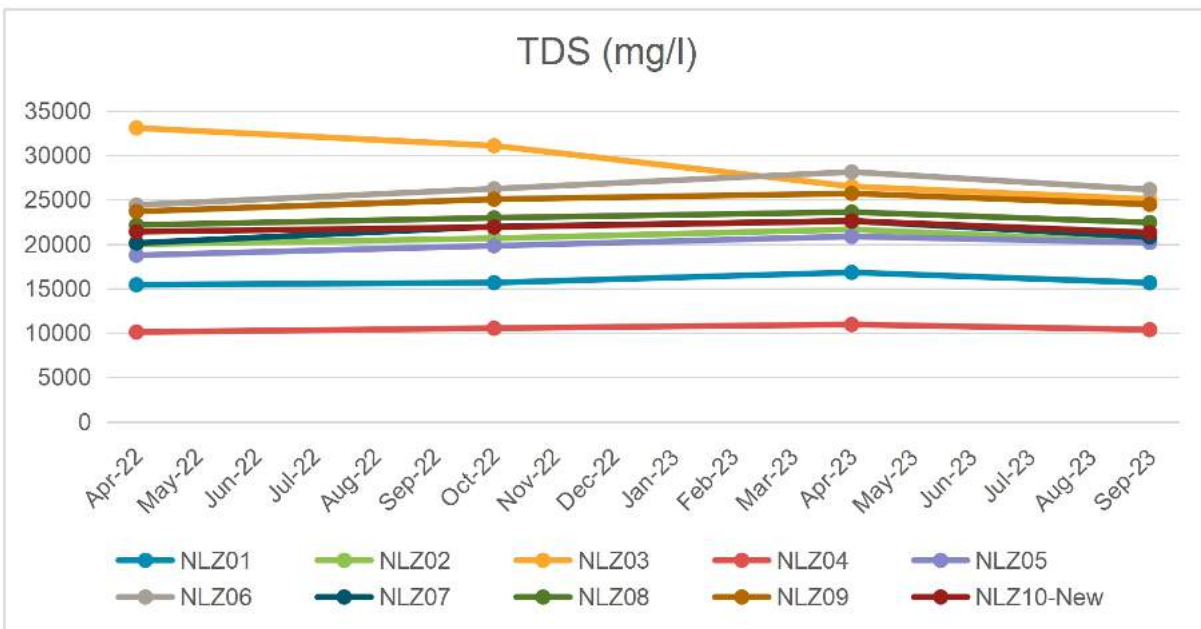


Figure 5: Total Dissolved Solids

6.2.4.2.1.3 TOTAL ALKALINITY

Total alkalinity indicates the ability of the water to neutralize acids and (hence increase pH), such that higher total alkalinity is desirable if there is a likelihood of acid mine drainage.

The total alkalinity levels for the reporting period range between 32mg/l and 245mg/l with an average of 149mg/l. NLZ01 is showing its usual low level of total alkalinity, however it should be noted that borehole is located up-gradient of the mine, so that any changes to the water quality are likely to indicate a shift in background levels, rather than resulting from any activities at the mine.

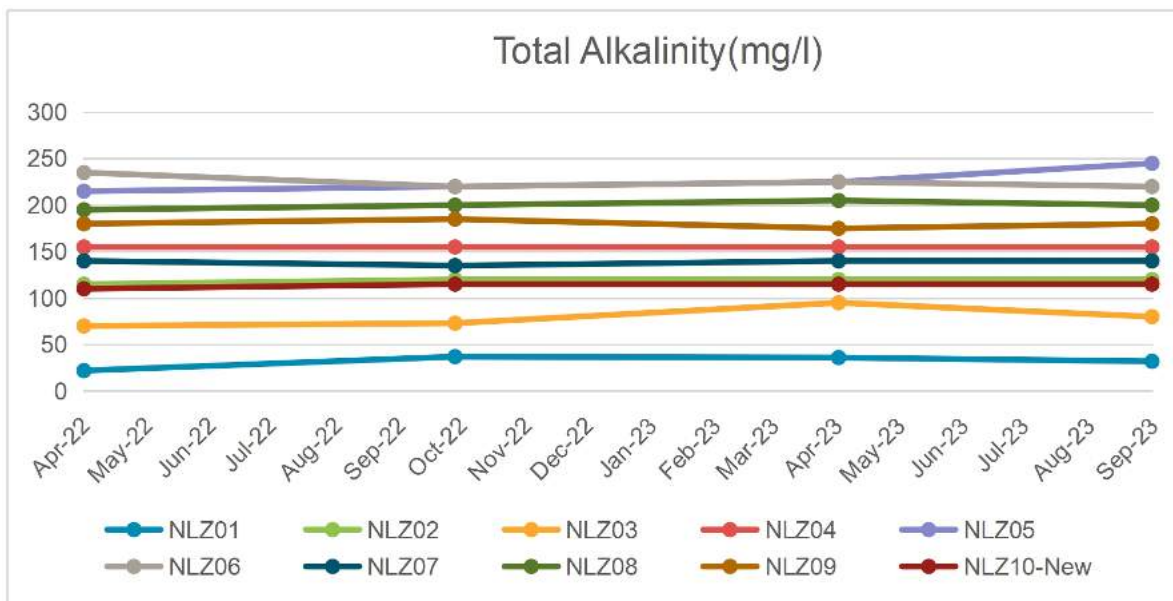


Figure 6: Total Alkalinity

6.2.4.2.1.4 SULPHATES

High levels of sulphate can indicate sources of pollution such as mine drainage and effluent return flows. During the reporting period the sulphate levels range between 1057mg/l and 3160mg/l with an average of 2181mg/l. The levels are within the baseline range.

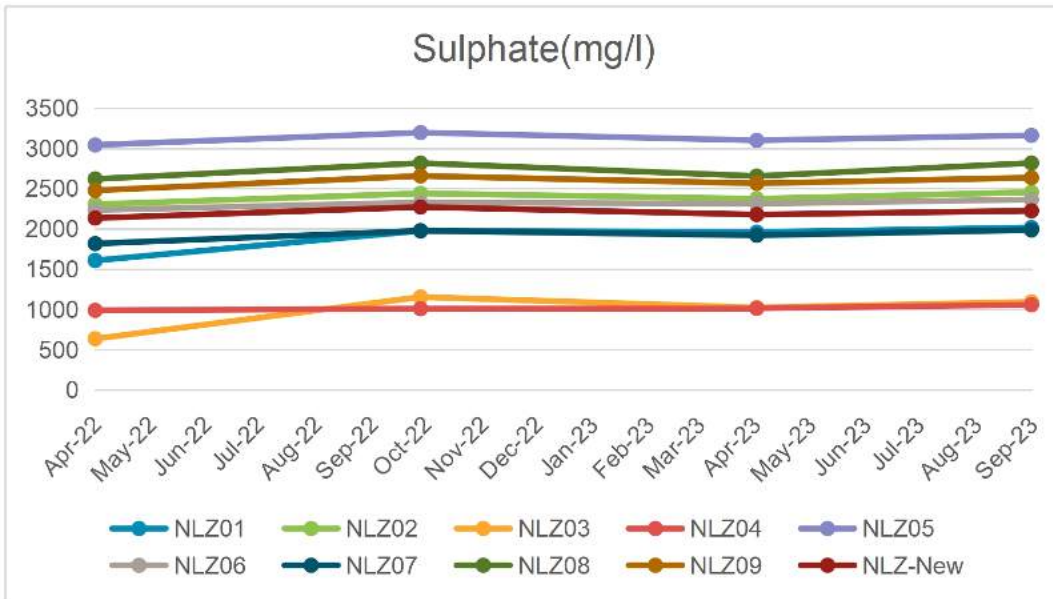


Figure 7: Sulphate

6.2.4.2.2 METALS

6.2.4.2.2.1 ARSENIC

There was a significant decrease in arsenic concentration was observed in two for the reporting period compare to the last period. The value ranged from 0.1µg/l to 1.4µg/l. m

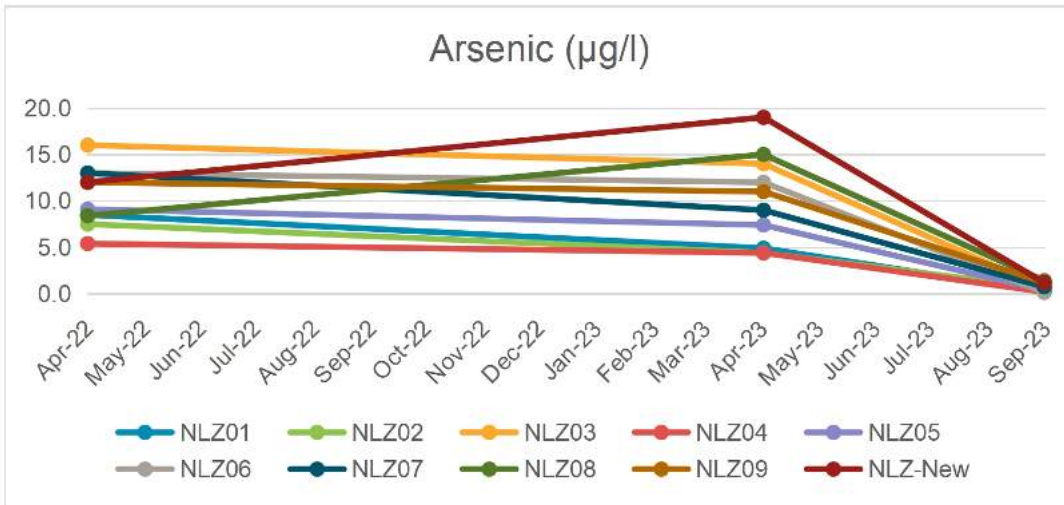


Figure 8: Arsenic

#### 6.2.4.2.2.2 LEAD

In all of the sampled water boreholes lead concentration is within the range of the previous reporting period. The average concentration for the reporting period is 14µg/l .

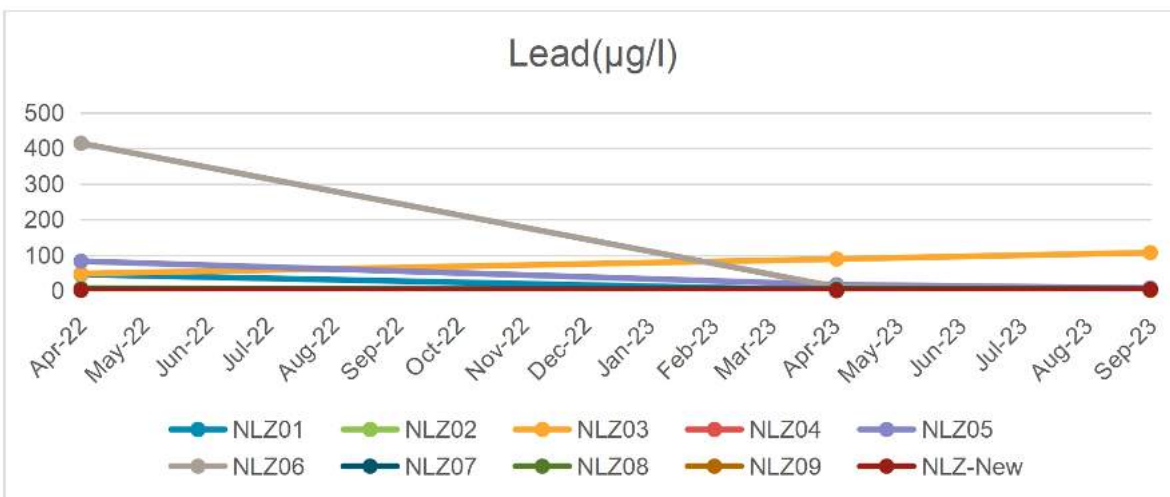


Figure 9: Lead

#### 6.2.4.2.2.3 URANIUM

Although all boreholes except one exceeded the recommended limit for uranium in drinking water of 30 µg/l, the levels are within the boreholes baseline readings. However boreholes levels are showing a decrease

compare to the previous reporting period. The levels for the reporting period vary between 0.3µg/l and 58µg/l.

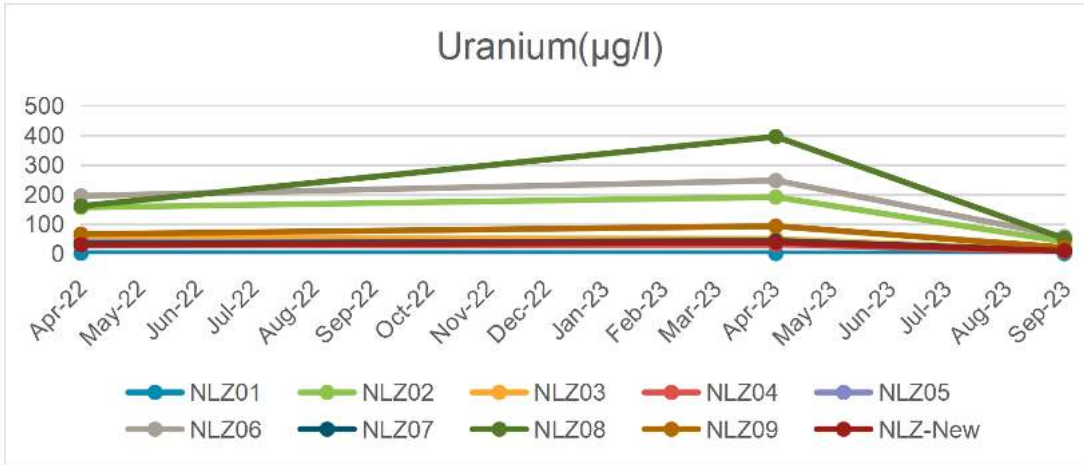


Figure 10: Uranium

#### 6.2.4.2.2.4 ZINC

The values for zinc for all the boreholes are within and way below the recommended guideline values for drinking water (3000 µg/l). The values for the reporting period range between 13µg/l to 381µg/l and are within the baseline data.

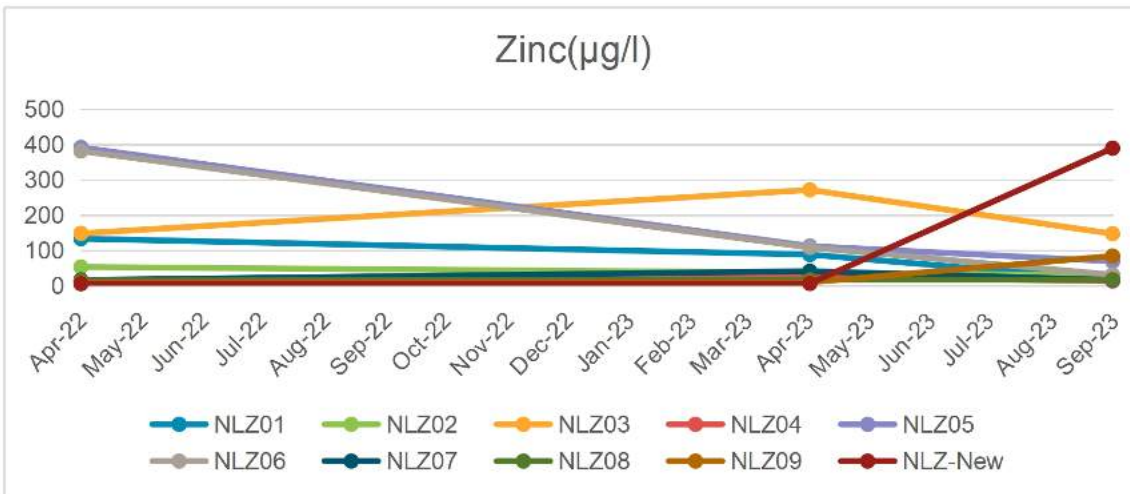


Figure 11: Zinc

#### 6.2.4.3 GROUNDWATER ABSTRACTION

During the reporting period no underground water was abstracted. The boreholes monthly water levels data were submitted to the Ministry of Agriculture, Water and Land Reform.



## 6.2.5 RESOURCE USAGE MANAGEMENT

### 6.2.5.1 DIESEL

During the reporting period a total **5864 liters** of diesel was consumed. The diesel was used for vehicles, and generators onsite.

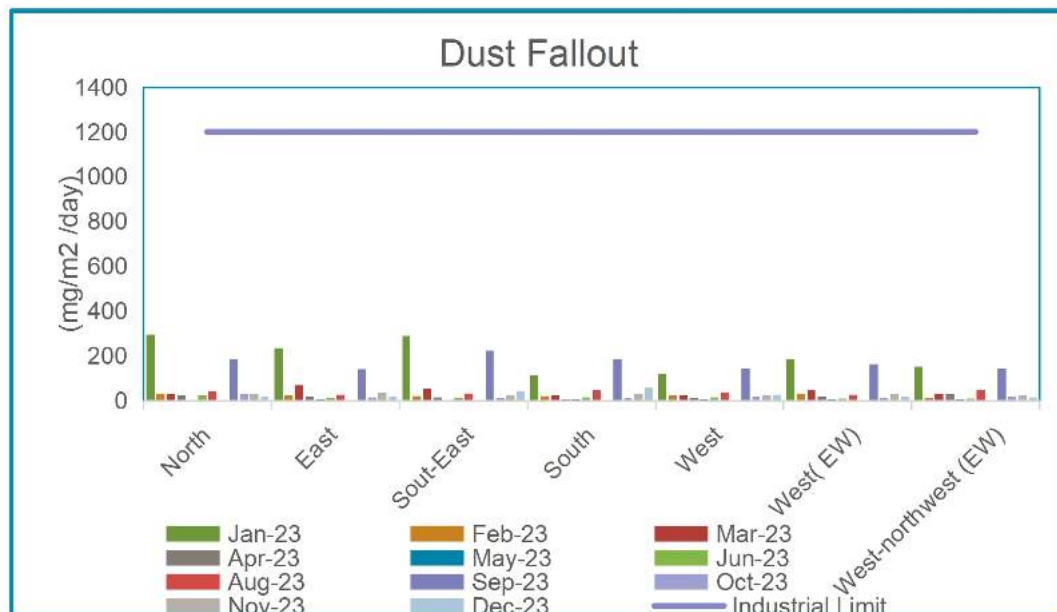
### 6.2.5.2 WATER USAGE

During the reporting period a total **446m<sup>3</sup>** of fresh water was received from Namwater. The water was used for kitchens and ablutions facilities.

## 6.2.6 AIR QUALITY MANAGEMENT

### 6.2.6.1 DUST FALLOUT

Dust fallout was in all areas well below the recommended industrial limit of 1200mg/m<sup>2</sup>/day. However the July results were very high, the east wind and high wind speed experienced in that contributed to the high dust fallout. The maximum wind speed for July was 58km/h.



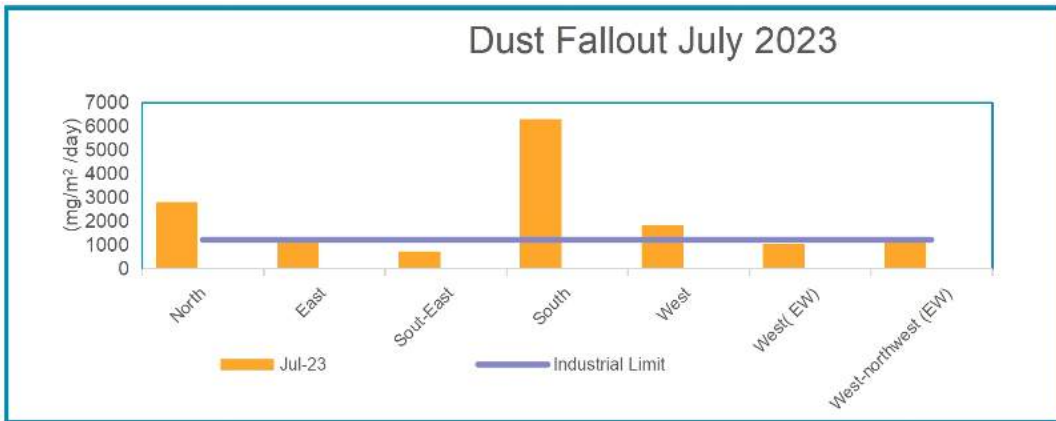


Figure 8: Dust fallout rate

### 6.2.6.2 DUST QUALITY

The samples for five parameters were below the 2019 baseline concentration. The results for Copper and Nickel were both above the 2019 averages.

Table 5: Dust metals concentration: Copper, Zinc and Cadmium

	Copper as Cu(µg/kg)							Zinc as Zn(µg/kg)							Cadmium as Cd(µg/kg)						
	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23
North	293	487	45	79	315	144	114	3926	3551	<0.289	<0.289		2094	1569	4	2.1	0.13	0.33	1.05	0.24	1.07
East	220	363	25	128	357	124	86	2126	2646	<0.289	<0.289	1839	1179	524	2	2.9	0.2	0.56	0.66	0.16	1.67
South East	56	93	37	125	349	154	114	432	882	<0.289	<0.289	2583	1334	216	1	0.9	0.3	0.54	0.87	0.58	3.57
South	302	371	46	75	274	150	170	4989	2945	<0.289	<0.289	2598	1724	5898	3	3.1	0.5	0.03	0.58	0.35	2.87
West	289	323	60	55	320	129	112	4984	3937	<0.289	<0.289	2017	1497		8	8.4	0.48	0.2	1.75	0.84	0.65
West (EW)	364	254	25	96	237	121	96	6535	2591	<0.289	<0.289	3429	1678	389	4	4.4	0.3	0.36	0.33	0.55	2.07
WNW	229	123	417	98	248	108	79	698	1398	3963	<0.289	1356	1018		2	2.8	3.3	0.36	0.56	0.12	1.07
2019 Average	82							4080							10						

Table 6: Dust metals concentration: Lead and Arsenic,

	Lead as Pb(µg/kg)							Arsenic as As(µg/kg)							
	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	
North	241	192	13	24	139.4	38.6		25	5.7	0.2	<0.042	11.4		5.9	8.5
East	114	158	14	46	138.4	39.6		17	7.7	<0.042	<0.042	9.4		3.7	9.5
South East	88	45	18	48	146.4	46.6		4	2	0.3	<0.042	9.4		3.6	11.5
South	201	189	27	17	114.4	52.6		22	6.7	0.6	<0.042	8.4		4.3	12.5
West	316	402	34	27	209.4	68.6		21	11	0.3	<0.042	9.4		5.2	6.9
West (EW)	214	239	19	34	79.4	42.6		23	6.7	<0.042	<0.042	8.4		4.7	5.6
WNW	169	144	172	34	121.4	27.6		16	5	16.4	<0.042	6.6		3.6	3.6
2019 Average	368							12							

**Table 6: Dust metals concentration: Nickel and Manganese**

	Nickel as Ni(µg/kg)							Manganese as Mn(µg/kg)						
	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Aug-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23
North	20	27	<0.25	<0.25	32.8	15.61	15.3	409	240	12	15	179.1	195.3	116.9
East	13	10	0.10	<0.25	26.8	10.61	16.3	241	201	13	36	149.1	154.3	170.9
South East	9	1.9	<0.25	0.3	10.8	13.61	18.3	149	90	16	38	171.1	178.3	307.9
South	22	19	<0.25	<0.25	56.8	14.61	17.3	480	262	15	12	162.1	198.3	196.9
West	17	16	0.4	5.9	70.8	12.61	17.3	403	321	21	8	202.1	164.3	130.9
West (EW)	39	7.6	<0.25	3.7	84.8	17.61	12.3	325	215	<50	19	125.1	173.3	136.9
WNW	12	4.6	45.3	5.9	78.8	13.61	7.6	256	135	213	18	127.1	146.3	72.9
<b>2019 Average</b>	<b>5</b>							<b>241</b>						

### 6.2.7 SOIL MANAGEMENT

Spills onsite are managed according to spill management procedures to prevent pollution on soil. Measures such as drip trays and placing liquid containers on platforms are encouraged.

### 6.2.8 WASTE MANAGEMENT

#### 6.2.8.1 WASTE ROCK

Waste rock from underground mine is on designated locations. Nothing mined during the period.

#### 6.2.8.2 SOLID WASTE

A small volume of general waste generated onsite was taken offsite to Swakopmund for disposal. As per park rules no waste should be disposed or buried onsite.

#### 6.2.8.3 LIQUID WASTE

No hydrocarbon waste was generated during the period under review.

#### 6.2.8.4 DOMESTIC EFFLUENT WASTE


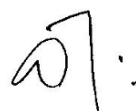
A large tank was constructed to receive domestic wastewater. It is emptied with a tanker truck by a reputable company for safe disposal offsite when necessary.

## 7 CONCLUSION

From the information presented NLZM:

- Operate under the relevant legal and other requirements.
- Continue to seek ways to further reduce impacts on the environment.
- Continue to improve environmental performance.
- Will integrate environmental management across the business.
- Chooses to openly and transparently report and present environmental performance.

NLZM remains committed to improve on current Environmental Performance and remains committed to operate under the laws of the Republic of Namibia.

<b>Submitted To:</b> Ministry of Environment, Forestry and Tourism			
<b>Submitted by:</b> Namib Lead and Zinc Mining PO Box 7185 Swakopmund Republic of Namibia Tel: +264 (0) 64 426 250 Fax: +264 (0) 64 426 251			
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Reviewed & approved	Luther Rukira	Mine Manager	 2024/03/04