



**KCM (Smelterco) Ltd
Nkana Refinery**

KCM-NK/003/2024

12th January, 2024.

The Director-General,
Zambia Environmental Management Agency,
Corner Suez and Church Roads,
P O Box 35131,
LUSAKA.

Dear Sir/Madam,



**RE: BI-ANNUAL STATUTORY REPORT FOR KCM (SMELTERCO) LIMITED – NKANA
REFINERY**

In fulfilment of the requirements under The Environmental Management Act 2011, Environmental Management (Licensing) Regulation 112 of 2013 which requires submission of bi-annual reports to the Zambia Environmental Management Agency Inspectorate, please find enclosed a copy of the statutory report covering the licences listed below for the period July to December 2023:

1. Pesticides and Toxic Substances Licence – NDL/PTS/00673/Z10/2014/3

- Storage of Pesticides and Toxic Substances – Nkana Anode Storage Casting room, Nkana Tankhouse, Nkana Acid Storage Tank No. 1, Nkana Acid Storage Tank No. 2, and Nkana Analytical Services Department.
- Transportation of Pesticides and Toxic Substances – Nkana Refinery

2. Emission Licence – NDL/EMM/00673/Z10/2014/3

- Discharge of Effluent – East Gate into North Uchi Stream
- Discharge of Effluent – Nkana Refinery into South Uchi Stream
- Emission of Air Pollutants at No. 4 Anode Furnace Stack – Anode Furnaces
- Emission of Air Pollutants at No. 5 Anode Furnace Stack – Anode Furnaces
- Emission of Air Pollutants at No. 6 Anode Furnace Stack – Anode Furnaces
- Emission of Air Pollutants at Nkana HFO Boiler stack – Nkana HFO Boiler

3. Hazardous Waste Licence – NDL/LHWM/00673/Z10/2014/3

- Generation of Used Oil, Fluorescent Tubes and Batteries – Nkana Refinery
- Storage of Used Oil, Fluorescent Tubes and Batteries – Nkana Refinery
- Generation and Storage of Healthcare Waste – Nkana Clinic
- Generation, Transportation and Handling of Expired Chemicals
- Generation, storage of spent copper electrolyte

4. Waste Management Licence – NDL/WM/00673/Z10/2014/3

- Own and operate Slag Dam No. 67

5. Ozone Depleting Substances Licence – NDL/ODS/00673/Z10/2014/3

- Handling of ozone depleting substances (ODS)

We thank you for your continued support.

Yours faithfully,



BOAS SIMFUKWE

ACTING REFINERY MANAGER

CC Manager ZEMA – Northern Region

**BI-ANNUAL REPORT TO THE ZAMBIA ENVIRONMENTAL MANAGEMENT
AGENCY (ZEMA) FOR THE PERIOD JULY TO DECEMBER 2023**

PART 1: The Environmental Management (Licensing) Regulations, 2013

PESTICIDE AND TOXIC SUBSTANCE LICENCE (Regulations 25, 27 and 28)

REAGENTS -REFINERY TANKHOUSE

The main reagents used for the metallurgical processing of copper at KCM SmelterCo Ltd Nkana Refinery are Lignosulphate and glue. They are ordered through Commercial, drawn and stocked at the Refinery reagent storage shed.

STORAGE

The reagents are kept at the refinery storage shed and transported on demand to the processing section for mixing. The Refinery reagents warehouse is constructed of a concrete floor, concrete walls and iron roofing sheets. The storage shed is secured and well ventilated. Below are the quantities of glue and Lignosulphate that were consumed during the period under review:

Table 1: Reagents used at Refinery

Month	Glue Opening Stock (KG)	Glue Receipt (KG)	Consumed (KG)	Glue Closing Stock (KG)	Lignosulphate Opening Stock (KG)	Lignosulphate Receipt (KG)	Consumed (KG)	Lignosulphate Closing Stock (KG)
Jul-23	28,809.34	0	149.26	28,660.08	38,219.75	0	117.25	38,102.50
Aug -23	28,660.08	0	333.70	28,326.38	38,102.50	0	258.19	37,844.31
Sept-23	28,326.38	0	231.12	28,095.26	37,844.31	0	182.11	37,662.20
Oct-23	28,095.26	0	384.80	27,710.46	37,662.20	0	307.27	37,354.93
Nov-23	27,710.46	0	151.20	27,559.26	37,354.93	0	119.09	37,235.84
Dec-23	27,559.26	0	127.21	27,432.05	37,235.84	0	98.16	37,137.68
TOTAL			1377.29				1088.07	

Note: No new stock of both glue and Lignosulphate was ordered nor received at Commercial stores during the period under review.

ANODE CASTING STORAGE ROOM

No Barium Sulphate was used during the period under review.

SULPHURIC ACID

KCM SmelterCo Nkana refinery uses Sulphuric acid during the electrolytic refining of copper. It is used as an additive in electrolyte to refine copper anodes to copper cathodes. The transporter for Sulphuric acid from KCM SmelterCo Nchanga to KCM SmelterCo was;

AWET Investments Limited,
Plot No. 5559/6,
Kasuba Road,
Ndola.

STORAGE

The storage facility is surrounded by bund walls which are sufficient to mitigate exposure concerns in an event of a bulk material release. The floor of the storage area is made of impervious material and safety signs are displayed at appropriate places. Access to the area is highly restricted to deter unauthorised entry. Additionally, the area is equipped with emergency spill kits designed to contain, control and clean up spills. Below are the quantities of Sulphuric acid that was transported to KCM SmelterCo Nkana refinery during the period under review.

Table 2: Sulphuric acid received at KCM Nkana refinery

Month	Quantity received (MT)
Jul-23	32.82
Aug -23	91.14
Sept-23	62.72
Oct-23	64.06
Nov-23	92.00
Dec-23	31.64
TOTAL	374.38

WATER TREATMENT PLANT

Sodium chloride was used for the water treatment process at KCM SmelterCo Refinery. It is used for softening water that is used at the HFO fired boiler. The table below indicates the amount of sodium chloride that was used at water treatment.

Table 3: Sodium Chloride usage at water treatment

Month	Opening Stock (KG)	Receipt (KG)	Closing Stock (KG)	Consumed (KG)
Jul-23	900	450	900	0
Aug -23	1350	0	1050	300
Sept-23	1050	1000	1750	300
Oct-23	1750	0	1450	300
Nov-23	1450	400	1850	0
Dec-23	1850	0	1550	300
Total		1850		1200

REAGENTS – ANALYTICAL LABORATORY

KCM SmelterCo Nkana analytical laboratory uses reagents to process various elemental analysis. The analytical laboratory draws the reagents from commercial stores and stocks them in a reagent storage shed which is well ventilated; and has an impermeable concrete floor, concrete walls and secured roofing.

Table 4: Analytical laboratory reagents

No.	Reagent name	Opening stock (01.07.2023)		Receipts		Closing stock (31.12.2023)		Variance (consumed)	
		QTY	UOM	QTY	UOM	QTY	UOM	QTY	UOM
1	Acetic acid					7500	L		L
2	Ammonium hydrogen difluoride	16000	g	0	g	14500	g	1500	g
3	Cupric Sulphate						g		g
4	Nitric Acid	75	g	0	L	50	L	25	L
5	Potassium Thiocyanate	9000	g	0	g	6000	L	3000	L
6	Potassium Iodide	1050	g	0	g	4500	g	6000	g
7	Std Solution Gold 1000mg/l	250	ml	0	ml	125	ml	125	ml
8	Iron Standard solution	1000	ml	0	ml	500	ml	500	ml
9	Std Solution Manganese 1000mg/l	500	ml	0	ml	250	ml	250	ml
10	Std Solution Silver 1001+/-2 mg/l	0	ml	0	ml	0	ml	0	ml

PART 2: The Environmental Management (Licensing) Regulations, 2013

EMISSION LICENCE (EFFLUENT DISCHARGE, Regulation 4)

KCM SmelterCo Nkana refinery uses various management and engineering controls to prevent effluent from reporting to the environment. KCM SmelterCo Nkana refinery has employed Zero discharge to prevent effluent discharge to the environment. Effluent generated from the plant is captured in the ponds and recycled for re-use for other plant operations.

Our Environmental Management System includes actions required to prevent pollutants from entering discharges from the mine and hence the environment. KCM is committed to not only meeting the limits set by Zambian Regulations but achieving the World Bank and IFC guidelines as part of its sustainability program.

Pollution Control Actions

The following pollution Control plans are in place;

- Regular cleaning of internal and Plant main drains.
- An effluent recycle pump that pumps effluent to the old power plant cooling water ponds to allow for settling of soluble compounds. A sand filter further treats the effluent to meet process quality requirements before being recycled back into the tank-house for re-use.
- Refinery surfaces are progressively rehabilitated to ease clean-up of any possible spills that may have a potential of ending up in the drains.
- Regular calibration of pH probes to ensure high reading efficiency.
- Programme of identifying water leaks and sealing off the same is ongoing.

EFFLUENT QUALITY IN LICENSED DRAINS

South Uchi

There was no effluent discharged to South Uchi during the period under review. KCM-SmelterCo Nkana is under Zero discharge. Effluent generated is captured, treated and recycled back into the system for re-use for other plant operations.

North Uchi

There was no effluent discharged to North Uchi during the period under review. Effluent discharged is pumped to the old power plant cooling water ponds and recycled back to the system for other plant operations. KCM SmelterCo-Nkana is under Zero discharge.

EMISSION LICENCE (EMISSION TO AIR, Regulation 4)

The permits to emit air pollutants at KCM SmelterCo Nkana refinery relates to the operations of the Anode furnaces No.4, No.5, No. 6 and HFO fired boiler. In order to comply with the general requirements of The Environmental Management (Licensing) Regulations, 2013, Konkola mine has engaged Tibon Environmental Solutions to monitor emissions from the stacks.

Emission Discharge at No.4, No.5 and No.6 Anode Furnaces

The operations at anode furnaces No 4, 5 and 6 were on cold standby during the period under review. No emissions were discharged to the environment.

Emission Discharge at HFO Boiler Stack

Table 5 HFO Boiler stack emissions

Month	Dust mg/Nm ³	CO mg/Nm ³	SO ₂ mg/Nm ³	NO _x mg/Nm ³
	50	100	850	-
Jul-23	37	83	100	736
Aug -23	*	*	*	*
Sept-23	37	98	6	23
Oct-23	38	46	187	62
Nov-23	*	*	*	*
Dec-23	*	*	*	*

Note: * (the HFO boiler was on standby)

Incidents recorded

No emission incidents were recorded during the period under review.

PART 3: The Environmental Management (Licensing) Regulations, 2013

HAZARDOUS WASTE LICENCE (GENERATION AND STORAGE, Regulation 19)

The plant generates hazardous waste namely; waste oil, used fluorescent tubes and used batteries. Waste oil is stored in the used oil tank. The storage area has an impervious floor and sufficient concrete bund wall capable of containing massive bulk spills if the tank were to suffer a catastrophic leak of the liquid. Spent fluorescent tubes generated are stored and crushed in fabricated storage drums within the plant premises. Used batteries are stored in the hazardous material storage shed

which is secure and has restricted access. The used batteries are disposed of through recycling/reuse through contractors.

USED OIL INVENTORY

Table 6: Shows the amount of used oil that was generated and stored during the period under review

Month	Generated
Jul-23	20
Aug -23	840
Sept-23	86
Oct-23	0
Nov-23	0
Dec-23	0
TOTAL	946

NOTE: Unit of measure is liters

USED BATTERIES INVENTORY

Table 7: Indicates the amount of spent batteries that was generated and disposed/sold during the period under review

Month	Opening Stock	Generated	Stored	Sold	Closing Stock
Jul-23	109	0	112	0	109
Aug -23	109	0	112	0	109
Sept-23	109	2	111	0	111
Oct-23	111	0	111	0	111
Nov-23	111	1	112	0	112
Dec-23	112	0	112	0	112
TOTAL	109	3	112	0	112

Note: Unit of measure is each.

FLUORESCENT TUBES INVENTORY

Table 8: Shows the amount of spent fluorescent tubes that was generated and crushed during the period under review

Month	Generated	Crushed
Jul-23	1	1
Aug -23	10	10
Sept-23	0	0
Oct-23	1	1
Nov-23	3	3
Dec-23	2	2
TOTAL	17	17

Note: Unit of measure is each.

SCRAP LEAD INVENTORY

No scrap lead was generated nor stored during the period under review.

SPENT ELECTROLYTE INVENTORY

During the period under review, a total of 1,401.00 MT of spent electrolyte was generated at Refinery Tank house and transported to Tailings leach plant in Nchanga for re-use.

Table 9: Spent electrolyte

Month	Generated (MT)
Jul-23	86.70
Aug -23	229.08
Sept-23	293.28
Oct-23	50.14
Nov-23	25.22
Dec-23	716.58
TOTAL	1401.00

GENERATION OF HEALTH CARE WASTE

Clinical waste generated from the mine clinic and plant site clinic is collected and transported to Kitwe teaching hospital for incineration. The clinical waste is transported in specialized secured containers which have warning signs. No incidences/accidental spillages relating to the transportation of healthcare waste were recorded during the period under review. The quantities generated are presented in Table 10 below:

Table 10: Clinical waste generated during the period under review

Month	Generated (MT)	Disposed through incineration (MT)
Jul-23	0.078	0.078
Aug -23	0.075	0.075
Sept-23	0.065	0.065
Oct-23	0.072	0.072
Nov-23	0.100	0.100
Dec-23	0.180	0.180
TOTAL	0.570	0.570

