

KCM SmelterCo LTD
KCM (SMELTERCO) LIMITED (A subsidiary of KCM plc)

KCM/SCO/NK/11

11th July, 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

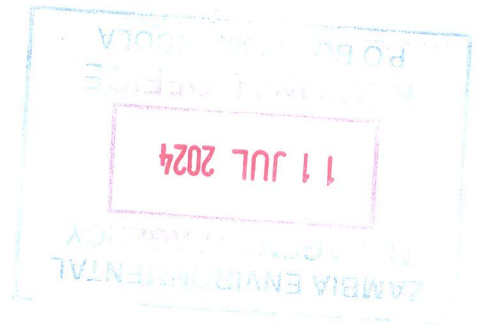
In fulfilment of the requirements under The Environmental Management Act 2011, Environmental Management (Licensing) Regulation 112 of 2013 which requires submission of bi-annual reports to the Zambia Environmental Management Agency Inspectorate, please find enclosed a copy of the statutory report covering the licences listed below for the period January to June 2024:

1. Pesticides and Toxic Substances Licence – NDL/PTS/00673/Z10/2014/2

- 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/Z10/2014/2

- 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/WM/00673/Z10/2014/2

- 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/LHWM/00673/Z10/2014/2

- Own and operate Slag Dam No. 67

5. Ozone Depleting Substances Licence – NDL/ODS/00673/Z10/2014/2

- Handling of ozone depleting substances (ODS)

We thank you for your continued support.

Yours faithfully,



RAYMOND CHEEBA
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

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

1.1 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.

1.1.1 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)
Jan-24	26,350.43	0	108.82	26,241.61	36,283.21	0	80.94	36,202.27
Feb -24	26,241.61	0	61.44	26,180.17	36,202.27	0	46.65	36,155.62
Mar-24	26,180.17	0	74.97	26,105.20	36,155.62	0	66.42	36,089.20
Apr-24	26,105.20	0	15.20	26,090.00	36,089.20	0	14.20	36,075.0
May-24	26,090.00	0	0	26,090.0	36,075.0	0	0	36,075.0
Jun-24	26,090.00	0	0	26,090.0	36,075.0	0	0	36,075.0
TOTAL			260.43				208.21	

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

1.2 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.

1.2.1 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

DATE	QUANTITY RECEIVED (MT)
Jan-24	62.50
Feb -24	0
Mar-24	29.66
Apri-24	0
May-24	0
Jun-24	0
TOTAL	92.16

1.3 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)	Consumed (KG)	Closing Stock (KG)
Jan-24	650	0	0	650
Feb -24	650	0	0	650
Mar-24	650	0	0	650
Apri-24	650	0	0	650
May-24	650	0	0	650
Jun-24	650	0	300	350
Total		0	300	

1.4 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 (01.01.2024)		RECEIPTS		CONSUMED		CLOSING STOCK (30.06.2024)	
		QTY	UOM	QTY	UOM	QTY	UOM	QTY	UOM
1	Acetic acid	7500	L	0	0	5	L	7495	L
2	Ammonium hydrogen difluoride	14500	GM	2500	GM	14500	GM	2500	GM
3	Nitric Acid	50	L	0	L	35	L	15	L
4	Potassium Thiocyanate	6000	GM	0	GM	4000	GM	2000	GM
5	Potassium Iodide	4500	GM	11000	GM	13000	GM	2500	GM
6	Std Solution Gold 1000mg/l	125	ML	0	ML	0	ML	125	ML
7	Iron Standard solution	500	ML	0	ML	250	ML	250	ML
8	Std Solution Manganese 1000mg/l	250	ML	0	ML	100	ML	150	ML

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

2.0 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.

2.1 EFFLUENT QUALITY IN LICENSED DRAINS

2.1.1 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.

2.1.2 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.

2.2 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.

2.2.1 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.

2.2.2 Emission Discharge at HFO Boiler Stack

No emissions were discharged from the HFO fired Boiler as it was on cold standby during the period under review.

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

3.0 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 off through recycling/reuse through contractors.

3.1 USED OIL INVENTORY

No used oil was generated during the period under review. 28,560Kg of used oil was sold off.

3.2 USED BATTERIES INVENTORY

No spent batteries were generated or disposed during the period under review.

3.3 FLUORESCENT TUBES INVENTORY

No spent fluorescent tubes were generated during the period under review.

3.4 SCRAP LEAD INVENTORY

No scrap lead was generated or stored during the period under review

3.5 SPENT ELECTROLYTE INVENTORY

During the period under review, a total of 77.60MT 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)
Jan-24	52.16
Feb -24	25.44
Mar-24	0
Apri-24	0
May-24	0
Jun-24	0
TOTAL	77.60

3.6 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 11 below:

Table 10: Clinical waste generated during the period under review

Month	Generated (MT)	Disposed through incineration (MT)
Jan-24	0.212	0.212
Feb -24	0.184	0.184
Mar-24	0.175	0.175
Apri-24	0.171	0.171
May-24	0.096	0.096
Jun-24	0.186	0.186
TOTAL	1.024	1.024

3.7 GENERATION, TRANSPORTATION AND HANDLING OF EXPIRED CHEMICALS

During the period under review there was no generation, transportation and handling of expired chemicals.

PART 4: The Environmental Management (Licensing) Regulations, 2013

4.0 WASTE MANAGEMENT LICENCE

KCM Nkana refinery has reclaimed the slag from the dump following its reclamation program which was initiated in May 2017 with the last reclamation being done in October, 2021. Dumping of slag on the dump ceased in February 2009. The entry to the slag dump is strictly by authorization from the security team which is re-enforced by the state paramilitary police. The statutory monitoring of the dump was conducted on 31st March 2020 by Knight Piesold. Radiation monitoring of the slag dump was not conducted during the period under review as KCM Nkana refinery was in the process of engaging Misenge Technical and Engineering Services (METS) to take up the service.

Table 11: Slag dump No.67

Area (Hectares)	11.83
Slag reclaimed by KCM during the period under review (tons)	0
Slag as at 30.06.2024 (tons)	5,600

PART 5: The Environmental Management (Licensing) Regulations, 2013

5.0 OZONE DEPLETING SUBSTANCES LICENCE

Ozone depleting substances are used in refrigeration and air conditioning equipment in office buildings.

5.1 HANDLING AND STORAGE OF OZONE DEPLETING SUBSTANCES

Whenever an ODS using unit is being decommissioned or serviced, refrigerants are recovered. During the recovery process, refrigerants are transferred into a cylinder that is empty or that contains the same type of refrigerant. This is always carried out in ways that ensure ODS do not leak to the atmosphere. Only competent personnel are responsible for handling, storage, transportation and disposal of contaminated refrigerants. Tools are available to identify potential leakage points of refrigeration and air conditioning equipment. Hazard and safe working practices for installation, commissioning and handling of refrigerants are also in place.

R410a was used on the plant for servicing and repairing air conditioners and fridges. The gas is stored in cylinders and kept at the instrumentation workshop which is well secured. During the period under review no gas was used to service the air conditioners.

Actions to prevent contamination to the environment:

- Testing for leakage of refrigerants.
- Monitoring of monthly Ozone Depleting Substances (ODS) consumption.

Ground Water Quality

There is historical contamination of ground water at KCM SmelterCo Nkana refinery which has been identified as a joint liability with Mopani Copper Mines. KCM SmelterCo Nkana engaged Golder Associates, an independent competent consultant who conducted a detailed study of contaminated ground water and flow movements. The table below outlines monitoring results for ground water during the period under review.

Table 14 Borehole monitoring data

Sample Date	Sample Description	Borehole Id	Ph	Tcu (Ppm)	Tco (Ppm)	Tfe (Ppm)	Tmn (Ppm)	Dcu (Ppm)	Dco (Ppm)	Dfe (Ppm)	Dmn (Ppm)	Sulphates
Jan-24	Settling ponds	NK-WM-01	5.45	21.30	1.88	0.26	7.05	21.23	1.70	0.00	6.24	845
	HFO Day Tanks	NK-WM-02	5.72	14.54	1.42	20.11	4.64	10.92	1.34	0.00	3.82	97
	Main HFO Tanks	NK-WM-03	4.90	974.40	52.40	0.00	115.20	936.00	51.20	0.00	60.80	710
	Copper loading bay	NK-WM-05	5.82	14.0	3.86	0.95	24.59	1347.00	3.67	0.09	15.92	304
	Refinery Northern boundary	NK-WM-06	5.48	148.23	5.87	0.31	14.16	130.11	4.98	0.00	13.15	64
Feb-24	No. 3 Acid plant	NK-WM-08	5.66	2.29	0.34	0.89	1.99	1.08	0.31	0.00	1.64	45
	Settling ponds	NK-WM-01	5.90	364.90	17.74	1.00	30.32	360.10	16.27	0.21	30.02	2053
	HFO Day Tanks	NK-WM-02	5.71	6.45	0.97	0.80	2.65	3.26	0.89	0.09	2.57	101
	Main HFO Tanks	NK-WM-03	5.65	4.67	0.96	2.90	3.36	4.66	0.92	0.05	3.03	531
	Copper loading bay	NK-WM-05	5.52	14.8	3.96	1.19	23.42	14.28	3.90	0.07	20.36	110
Mar-24	Refinery Northern boundary	NK-WM-06	5.50	140.62	6.23	0.78	25.49	138.85	5.51	0.00	15.53	1532
	No. 3 Acid plant	NK-WM-08	5.47	3.82	0.82	0.51	3.94	1.88	0.80	0.00	2.71	59
	Settling ponds	NK-WM-01	-	-	-	-	-	-	-	-	-	-
	HFO Day Tanks	NK-WM-02	-	-	-	-	-	-	-	-	-	-
	Main HFO Tanks	NK-WM-03	-	-	-	-	-	-	-	-	-	-
Mar-24	Copper loading bay	NK-WM-05	-	-	-	-	-	-	-	-	-	-
	Refinery Northern boundary	NK-WM-06	-	-	-	-	-	-	-	-	-	-
	No. 3 Acid plant	NK-WM-08	-	-	-	-	-	-	-	-	-	-
Who Drinking Water Standards				1.00	N/A	2.00	0.01	-	-	-	-	-

Sample Date	Sample Description	Borehole Id	Ph	Tcu (Ppm)	Tco (Ppm)	Tfe (Ppm)	Tmn (Ppm)	Dcu (Ppm)	Dco (Ppm)	Dfe (Ppm)	Dmn (Ppm)	Sulphates
Apr-24	Settling ponds	NK-WM-01	-	-	-	-	-	-	-	-	-	-
	HFO Day Tanks	NK-WM-02	-	-	-	-	-	-	-	-	-	-
	Main HFO Tanks	NK-WM-03	-	-	-	-	-	-	-	-	-	-
	Copper loading bay	NK-WM-05	-	-	-	-	-	-	-	-	-	-
	Refinery Northern boundary	NK-WM-06	-	-	-	-	-	-	-	-	-	-
May-24	No. 3 Acid plant	NK-WM-08	-	-	-	-	-	-	-	-	-	-
	Settling ponds	NK-WM-01	5.4	11.75	1.39	2.83	6.81	11.14	1.36	0.58	6.76	289
	HFO Day Tanks	NK-WM-02	5.8	1.50	0.23	1.77	1.52	1.47	0.19	0.26	1.36	933
	Main HFO Tanks	NK-WM-03	4.0	341.44	17.84	2.58	61.13	325.41	17.26	0.78	51.40	2281
	Copper loading bay	NK-WM-05	4.2	144.6	5.86	1.93	28.26	138.07	2.41	0.72	26.70	1598
Jun-24	Refinery Northern boundary	NK-WM-06	4.2	16.31	7.81	3.47	26.78	14.98	6.17	0.89	16.84	1259
	No. 3 Acid plant	NK-WM-08	5.2	4.35	1.04	2.54	7.66	1.66	1.00	1.01	7.41	365
	Settling ponds	NK-WM-01	6.2	2.83	1.93	7.40	2.82	1.57	1.83	0.00	2.48	321
	HFO Day Tanks	NK-WM-02	4.5	146.40	5.65	2.28	16.79	132.40	5.14	0.00	15.02	1607
	Main HFO Tanks	NK-WM-03	4.1	6720.0	455.00	217.00	547.00	6574.00	405.00	19.00	547.00	9449
WHO DRINKING WATER STANDARDS	Copper loading bay	NK-WM-05	4.4	15.3	3.20	4.01	7.35	12.75	3.19	0.02	7.23	1795
	Refinery Northern boundary	NK-WM-06	4.6	137.20	5.35	2.40	12.41	129.30	5.68	0.00	11.91	1630
	No. 3 Acid plant	NK-WM-08	6.2	2.67	1.66	5.11	1.08	0.61	1.63	0.00	0.73	1282
				1.00	N/A	2.00	0.01	-	-	-	-	

Note that for the month of March 2024 and April 2024 the machine was defective.



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EUNUCE HAMALALA

**ENVIRONMENTAL COORDINATOR
SMELTERCO**



MUNKONDYA MOSES

MANAGER ENVIRONMENT