REPORT OFCOMMITTEE
IN COMPLIANCE
OF
ORDER OF HON'BLE NGT, PRINCIPAL BENCH NEW DELHI
IN THE MATTER OF OA NO. 70 OF 2021

(Brackish Water Research Centre
v/s
Gujarat Pollution Control Board & Others)

APPLICATION WRT GRIEVANCE AGAINST VIOLATION OF M/S. HINDALCO INDUSTRIES LIMITED, DAHEJ, DISTRICT BHARUCH, GUJARAT

UNDER THE CHAIRMANSHIP OF JUSTICE B.C. PATEL
FORMER CHIEF JUSTICE, DELHI HIGH COURT AND FORMER JUDGE OF THE GUJARAT HIGH COURT

PREPARED BY

Ministry of Environment, Forest & Climate Change

Gujarat Pollution Control Board

Forests Department
Government of Gujarat

SEIAA Gujarat

GCZMA

FOR SUBMISSION TO

HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

MAY 2022

REPORT OF COMMITTEE IN COMPLIANCE OF ORDER OF HON'BLE NGT, PRINCIPAL BENCH, NEW DELHI IN THE MATTER OF OA NO. 70 OF 2021 (BRACKISH WATER RESEARCH CENTRE V/S GUJARAT POLLUTION CONTROL BOARD & OTHERS) WRT GRIEVANCE IN THE APPLICATION AGAINST VIOLATION OF M/S. HINDALCO INDUSTRIES LIMITED, DAHEJ, DISTRICT BHARUCH, GUJARAT

As per order of Hon'ble National Green Tribunal, Principal Bench, New Delhi

(Dated: 05.01.2022)

COMMITTEE MEMBERS

Hon'ble Justice Shri B.C. Patel Former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court, Ahmedabad	
Prof. (Dr.) V. K. Srivastava Member SEIAA, Gujarat	SEIAA Gujarat
Dr. Yogesh Kumar Scientist 'C' MoEF & CC, Regional Office, Gandhinagar	Ministry of Environment, Forest & Climate Change
Mr. S. Pradeep Raj Scientist 'D' CPCB, Regional Directorate, Vadodara	
Dr. K V George Senior principal Scientist, NEERI, Nagpur	NEERI
Prof. (Dr.) Chinmay Ghoroi Professor Department of Chemical Engg, IIT, Gandhinagar	
Mr. K. N. Vaghamshi DEE GCZMA, Gandhinagar	GCZMA
Mr. Kripal Singh Gohil RFO and I/c ACF Forest Department, Bharuch	Forests Department Government of Gujarat
Mr. F.M. Modi Regional Officer GPCB, Regional Office - Bharuch	Gujarat Pollution Control Board

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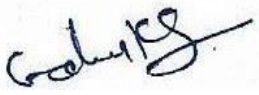
Dr. Yogesh Kumar	Regional Office, MoEF & CC, Gandhinagar	
Mr. S. Pradeep Raj	CPCB, Regional Directorate, Vadodara	
Dr. K. V. George	NEERI, Nagpur	
Prof. (Dr.) Chinmay Ghoroi	Department of Chemical Engineering, IIT, Gandhinagar	
Mr. K. N. Vaghamshi	GCZMA, Gandhinagar	
Mr. Kripal Singh Gohil	Forest Department, Bharuch	
Mr. F.M. Modi	Regional Office, GPCB, Bharuch	

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1.0 BACKGROUND

Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi passed an order in the matter of Original Application No. 70/2021 (WZ) (Brackish Water Research Centre v/s Gujarat Pollution Control Board & Others) on 05th January, 2022. The matter is based on the Application made by the Applicant before the Hon'ble National Green Tribunal regarding the grievance against continued violation of Birla Copper Plant being operated by Hindalco (M/s. Hindalco Industries Ltd) located at Villages Lakhigam & Dahej, Tal-Vagra, District-Bharuch. Copy of the said order passed by Hon'ble NGT vide order dated: 05.01.2022 is given in **Annexure-1** for reference.

Hon'ble NGT vide its said order dated: 05.01.2022 directed to constitute a seven member joint committee headed by Hon'ble Justice B.C. Patel, former Judge of Gujarat High Court & former Chief justice of J&K and Delhi High Courts with representatives of MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF and GCZM as members. Accordingly, joint committee is constituted under the chairmanship of Hon'ble Justice B. C. Patel. The said order also directs that meeting of the Committee may be convened preferably within three weeks.

Relevant portion of the order of Hon'ble NGT dated 05.01.2022 is reproduced below:

"20. In the light of above, we consider it appropriate to constitute a seven member joint Committee headed by Justice B.C. Patel, former Judge of Gujarat High Court & former Chief Justice of J&K and Delhi High Courts with representatives of MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF (HoFF) Gujarat and Gujarat Coastal Zone Management Authority as members. The CPCB and State PCB will be the nodal agency for coordination and compliance. Meeting of the Committee may be convened preferably within three weeks. The Committee or such of its members as may be decided by the Chairman may undertake visit to the site and interact with stakeholders. The Committee will be free to co-opt any other expert/ institution for its assistance and conduct proceedings online, if necessary. The parties will be free to put

forward their respective written version before the Committee through the GPCB within three weeks from today. The Committee may preferably give its report within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF. A copy of the report may also be uploaded on the website of GPCB for response of the parties, if any before the next date."

2.0 CONSTITUTION OF THE COMMITTEE

In compliance to the order of the Hon'ble NGT, a seven member joint committee was constituted headed by Justice B.C. Patel, former Judge of Gujarat High Court & former Chief Justice of J&K and Delhi High Courts. The order also states that the committee will be free to co-opt any other expert/ institution for its assistance and conduct proceedings online, if necessary. Accordingly, members were co-opted from IIT-Gandhinagar and NEERI, Nagpur. The details of the all the committee members are given in the table below:

01	Hon'ble Justice Shri B.C. Patel Former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court, Ahmedabad	Committee Chairman
02	Prof. (Dr.) V. K. Srivastava Member, SEIAA, Gujarat	Member
03	Dr. Yogesh Kumar Scientist 'C', MoEF & CC, Regional Office, Gandhinagar	Member
04	Mr. S. Pradeep Raj Scientist 'D', CPCB, Regional Directorate, Vadodara	Member
05	Dr. K. V. George Senior principal Scientist, NEERI, Nagpur	Member
06	Prof. (Dr.) Chinmay Ghoroi Professor, Department of Chemical Engg, IIT, Gandhinagar	Member
07	Mr. K. N. Vaghamshi DEE, GCZMA, Gandhinagar	Member
08	Mr. Kripal Singh RFO and I/c ACF, Forest Department, Bharuch	Member
09	Mr. F.M. Modi Regional Officer, GPCB, Bharuch	Member

3.0 APPROACH & ACTIVITIES CARRIED OUT BY THE COMMITTEE

Hon'ble NGT in its order dated: 05.01.2022 stated that even if there is now compliance as claimed by the PP, accountability needs to be fixed for the past violations in the matter of leachate management, slag management, TSDF management, air, water and soil pollution, damage to the forest and mangroves and compliance of the consent and EC conditions, after verification of facts for five years prior to filing of the application (i.e. 17.09.2021) and continuing violations, if still found. The order also stated that apart from remediation and restoration plan, the compensation has to be assessed on principle of restoration with element of deterrence. It was also directed the meeting of the committee may be convened preferably within three weeks. NGT order also states that the Parties will be free to put forward their respective written version before the Committee through the GPCB within three weeks from today (i.e. from 05.01.2022). However, no written version has been received by GPCB from any parties regarding the same.

Accordingly, the first meeting of the committee was convened on 21.01.2022 through online. Copy of the minutes of the meeting is placed as **Annexure-2**. Second meeting of the committee was convened on 01.02.2022. Copy of the minutes of the meeting held on 01.02.2022 is placed as **Annexure-3**. Subsequently, third meeting of the committee was convened on 15.02.2022 during which an interim visit to the industry by CPCB & GPCB was decided. Copy of the minutes of third meeting held on 15.02.2022 is placed as **Annexure-4**. The fourth meeting of the joint committee was held on 14.03.2022. During the joint Committee's meeting held on 14.03.2022, the report on the interim visit made by CPCB & GPCB was discussed and the date for site visit by the joint committee was finalized. Accordingly, the site visit by the joint committee was carried out during 30.03.2022 to 31.03.2022. Copy of the minutes of the meeting held on 14.03.2022 is placed as **Annexure-5**.

The committee adopted following methodology during the visit for the compliance of the order and the sequence of two days plant and site visit carried out by the committee during 30.03.2022 and 31.03.2022 are given below:

Day-1 (30.03.2022)

1. After the arrival at the unit by the committee, an introductory presentation was made by unit about the plant and provided technical clarifications regarding generation of different wastes and hazardous wastes and other details.
2. The committee visited the 16-hectare area diverted to the unit from the forest area.
3. Abandoned port construction area behind Bhoothnath Mahadev Temple
4. Collection of soil samples from forest area and Bhoothnath Mahadev Temple
5. Visit to GMB Port area
6. Visit to Captive Jetty of Birla Copper
7. Visit to the Precious Metal Recovery Plant

Day-2 (31.03.2022)

1. Visit to the in-house Secured Land fill site
2. SLF Borewell 5 area
3. Lakhigam canal and outfall
4. Phosphogypsum Yard and Slag Yard
5. Coal Handling Area
6. Tertiary Water Recycling Unit
7. Fertilizer Plant and drain 9
8. Sulphuric Acid plant-1
9. Refinery-1 Plant
10. Smelter-1 Plant
11. Smelter-3 Plant
12. CCR-3 Plant

4.0 INSPECTION AND MONITORING BY CPCB & GPCB

During the joint Committee's meeting held on 15.02.2022, it was decided that a joint team of CPCB and RO-GPCB will visit the industrial unit (M/s. Hindalco Industries Limited) and will submit an interim visit report to the committee along with analysis report of the samples collected to assess overall compliance status of the unit and also to verify the operational status of various units in the industry and the compliance status of observations &

recommendations made by GPCB during the previous visit. The copy of the minutes of meeting of the joint committee held on 15.02.2022 is given in Annexure-4. Accordingly, inspection and monitoring of M/s. Hindalco Industries Ltd., Dahej was jointly carried out by the following officials from CPCB & GPCB during 18.02.2022 to 19.02.2022 and the 'Report on Inspection-cum-monitoring of M/s. Hindalco Industries Limited carried out by CPCB & GPCB' is placed as **APPENDIX-I**.

The details of the compliance status of the unit with respect to the violations mentioned in the Applications filed in the Hon'ble NGT, the details of the Environmental Management System being adopted by the unit including the wastewater management system, air pollution management system, hazardous & other wastes management are described in detail in the said interim visit report. The details of the Environment Monitoring carried out during the interim visit by CPCB & GPCB which includes Ambient Air Quality Monitoring, Source Emission monitoring, monitoring of ETP, ground water quality monitoring, leachate sampling, monitoring of water ponding in Reserve forest area, soil sampling are also described in detail in the said report.

5.0 ABOUT THE INDUSTRY

Birla copper a unit of Hindalco Industries Limited (earlier known as Indo Gulf Corporation Ltd.) has set up a copper smelting and refining complex in the year 1997 at Survey No. 29 to 39,101,104 to 110,112 to 115,117 to 122, 1504/P of village Dahej (Plot No. 2 of Dahej GIDC) and Survey No 646 to 671, 679, 685, 732 to 742, 744 to 752 of Village: Lakhigam, Taluka: Vagra, Dist: Bharuch, Gujarat.

The plant presently manufactures Copper Cathode, continuous cast copper rod, Sulphuric acid and precious metals. The unit has an Oxygen plant, Effluent Treatment Plant and captive power plants. The unit also has its own jetty. The Copper Smelter Complex is located at about $21^0$42' N Latitude & $72^0$33'E Longitude with the Total area of 327 Ha.

Initially the plant was set up with a 1,00,000 TPA capacity Copper Cathode capacity in 1998, which was further augmented to 1,50,000 TPA in 2003, 2,50,000 TPA in 2004 and 5,00,000

TPA in 2006. Cast Copper Rod Capacity has been expanded from 1,12,000 TPA to 2,40,000 TPA in 2009 and subsequently to 4,84,000 TPA in 2017.

M/s Hindalco Industries Limited has obtained Consolidated Consent and Authorization (CCA) from Gujarat Pollution Control Board (GPCB) vide Consent Order No. AWH-1028216, dated: 30.05.2020 with validity up to 02.03.2026 (copy of the CCA is placed as **Annexure-6**) for the production of following Products & By-products:

S. No.	Products	Quantity (MT/Annum)
1.	Cathode Copper	500000
2.	Sulfuric Acid (98.4%)	1470000
3.	Oxygen (Tech)	780000
4.	Gold	26
5.	Silver	200
6.	CC Rod	484000
7.	Phosphoric Acid (as P2O5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60
10.	Copper Wire (< 4 mm dia)	60000

S. No.	Name of By-Products	Quantity (TPM)
1.	Selenium	60 TPM
2.	PGM Concentrate	0.0508 TPM
3.	Granulated slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	Hydro fluosilicic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

The industry had earlier obtained CCA from GPCB vide Consent order no. AWH-62117 issued on 11.06.2014 for the production of above products and by-products except Copper wire and with quantity of CC Rod being 240000 TPA. The said CCA was valid up to 02.03.2019 and later amended on 07.10.2014 with extension of validity of CCA up to 02.03.2020. Copy of the said CCA dated: 11.06.2014 & its amendment are given in **Annexure-7** for reference.

The unit has obtained ISO 14001 certification for environmental management system and ISO 9001 certification for its quality system. The unit also has valid Public Liability Insurance and holds licenses under Factory Act and Indian Explosives Act.

The location of the Industry with marking of the boundary, adjacent Villages, Jetty of the industry located in Gulf of Khambhat are earmarked on Google image and shown in Figure below.

Figure: *Marking of boundary of the industry and its location on Google Image*

6.0 CURRENT STATUS WITH RESPECT TO VIOLATION MENTIONED IN APPLICATION FILED IN HON'BLE NGT

The present status observed with reference to violations mentioned in the application filed before NGT is as under:

S. NO.	VIOLATION MENTIONED IN APPLICATION FILED IN HON'BLE NGT	CURRENT COMPLIANCE STATUS
1	Untreated water from Copper Slag storage area flowing into CRZ-1A area.	All the storm water drain within the premises found dry and no waste water/contaminated water is going outside premises during the visit.

2	High Hydrogen fluoride (HF) emissions from Phosphoric Acid Plant etc.	PAP Plant has been closed permanently during April 2020 and initiated the dismantling process.
3	Sulphuric acid parameters of 25 mg/ Nm^3 (normal cubic meter) not being met on account of non-functional acid mist eliminator.	During visit, abnormal emission from the SAP plant stacks is not observed visually. Stack emissions sampling are carried out from the stack attached to SAP Plant – 1 as well as SAP Plant – 3 to check emission from the stacks and the analysis results are found within the norms prescribed in CCA.
4	Groundwater Contamination.	Ground water samples from the 10 piezometric borewells located within premises of the industry are collected to check the contamination in ground water. The analysis results of GW samples indicate: i. Copper in the range of 0.02 to 0.48 mg/l, ii. Cadmium in the range of BDL to 0.23 mg/l iii. Chromium in the range of: BDL to 0.41 mg/l iv. Lead & Arsenic are BDL for all the samples. v. Nickel in the range of 0.003 to 0.214 mg/l vi. Zinc in the range of 0.5 to 11.54 mg/l The variation in the values for few parameters among the different locations may be due to the varying depth of piezometer wells.
5	Dumping of Arsenic bearing sludge in captive TSDF site without encapsulation.	Arsenic Bearing residue (containing 10 to 15 % Arsenic) generated from the refinery plant is recycled in the smelting furnace and there is no disposal of this Arsenic bearing residue. ETP sludge generated contains 1.5 to 2 % of arsenic. It is informed that the arsenic content ETP sludge is in stable salt form and which doesn't leach. ETP sludge is disposed in own captive SLF. Samples of leachate from leachate collection sumps of operational SLF – 8A and 8B was collected to check the arsenic content in leachate of SLF. The analysis results of the samples collected from the sump no.01 and sump no. 05 attached to SLF 8 reveals that the Arsenic concentrations are BDL and 0.4mg/L in sump no. 01 & 05 respectively. The leachate being collected in the leachate collection sumps are further treated in the ETP of the unit.
6	Non-provision of leachate collection system for captive TSDF SLF Cell No.7.	Leachate collection system is provided in all SLF Cells including SLF-7.
7	Leachate water from captive TSDF site travelling out of the unit premises into the Gulf of	Previously, reportedly there was overflow from the leachate collection sump of SLF – 7 during monsoon. To prevent such situation, unit has raised height of

	Khambhat.	leachate collection sumps and all leachate collection sumps are provided with top covers to prevent entry of rain water into the sump. Leachate generated in the leachate collection sump is transferred into ETP of the industry through tanker. The frequency of tankers has been increased to avoid large accumulation in the leachate collection sump. During visit, there is no overflow from any of the leachate collection sumps.
8	Release of Sulphur oxides (SOx) and Sulphur dioxide (SO2) from the manufacture of Sulphuric acid from the Sulphuric acid plant (SAP) due to inefficient scrubbing system and improper functioning of APCM (air pollution control monitoring devices) causing eye irritation amongst the residents of the nearby villages.	During visit, abnormal emission from the SAP plant stacks is not observed visually. Stack sampling are carried out from the stack attached to SAP Plant – 1 and SAP Plant – 3 and the analysis results of the same are found within the norms prescribed in CCA.
9	It is also observed that unit has connected another pipeline to RO reject discharge line from first stage treated w/w holding lagoon (which is bypass line bypassing the second state treatment ETP) and can be discharged directly from the first stage treated w/w Holding lagoon without polishing treatment.	The pipeline bypassing the second stage treatment which was observed earlier has been removed. Presently, there is only one discharge line from final outlet of ETP to the deep sea disposal point.
10	Ponding of water/wastewater is observed at back side of ETP lagoon outside the premises. Soil near ponding looks yellowish and black coloured.	No water/waste water ponding observed anywhere within the premises.
11	Unit is using water for dust suppression in copper slag storage heaps, near smelter no.3 which leachate is spreading go nearby open area outside the premises resulting in huge ponding of waste water outside premises near this location.	Copper slag previously stored in open area near smelter – 3 has been shifted into dedicated copper slag storage yard. There is no copper slag storage found in open area near smelter-3 and there is no ponding of wastewater or contaminated water inside the premises during the visit.
12	Due to leakages from the top of caustic scrubber 1 strong SO_2 is felt in this area.	The leakages observed earlier in the scrubber in SAP-1 have been rectified and presently there is no leakage in the scrubber and no fugitive emission observed during the visit.
13	Strong SO_2 smell is felt near Sulphuric Acid Plant1.	SO_2 smell is not felt in the SAP-1 area during the visit.
14	Heavy dusting is observed from the conveyor belt for the conveyance of powder material.	There was dusting observed earlier in the conveyor belt in PAP plant. Presently, PAP plant has been stopped permanently and there is no such dusting

		observed during the visit. It was informed that the PAP has been closed during April 2020.
15	Unit has not provided wet scrubber or any other APCMs in coal handling area.	Unit has provided covered conveyor system for transportation of coal and also provided Bag filters at Conveyor junction towers (3 nos.) and at crusher (1 No.). Carrying out dust suppression using mobile mist canon in the coal yard area. Provided garland drain around the coal yard & roads beside coal handling area has been converted to concrete roads. Further, unit has provided wind screens at all sides of the coal handling area. The unit has provided peripheral sprinklers and a dry foggers machine in the coal yard.
16	Heavy dusting is observed from the huge quantity of fly ash dumped on open land opposite CPP-2/3 and spreading in the ambient air.	Unit has provided two Fly Ash silos of capacity 600 MT and 1200 MT with pneumatic conveying system and disposal by closed bulker to control dusting from fly ash.
17	During inspection, huge quantity of Phosphogypsum is found stored in the Phosphogypsum storage yard within the premises which is open to sky. Storage of Phosphogypsum sludge is observed not in environment friendly manner.	The source of phosphogypsum generation was PAP plant. The unit has already stopped PAP plant and presently there is no generation of phosphogypsum sludge. The old stock of phosphogypsum is being sent to cement industries and sent for fertilizer use. Presently, unit has stock of 12,00,000 MT of Phosphogypsum sludge, which is completely covered with HDPE liners.
18	Continuous Seepage of acidic greenish coloured wastewater is observed in SAP 1 area. Seeped wastewater is being accumulated in kachcha drain.	The source of the earlier observed seepage of acidic greenish COLOURED wastewater in SAP-1 area had been already identified & rectified and seepage was stopped. The accumulated seeped wastewater was already taken into ETP for further treatment. Further, the internal process drain has been changed from kachcha drain to RCC drain. During inspection no leakage/ seepage of wastewater or accumulation of wastewater is observed at this location.
19	To remove deposited sludge in ETP tanks to increase efficiency of ETP.	During inspection, three Neutralization/ Reaction tanks are observed in smooth operation without any sludge deposition and the remaining two tanks are found empty for receiving effluent.
20	ESPs attached to Smelter plant 3 are observed not in operation during shut down and cleaning period of smelter plant 3 furnaces. Heavy dust & SO2 gas emission is observed being emitted through process vent of common scrubber of Smelter plant 3.	The ESP attached to the smelter plant-3 has been replaced completely with new one. The APCM provided with the Smelter Plant-3 including ESP is found in operation during the visit. During visit, abnormal emission from the Smelter plant-3 is not observed visually. Stack sampling are carried out from the stack attached to Smelter plant-3 and the analysis results of

		the same are found within the norms prescribed in CCA.
21	During visit, Heavy fugitive emission is observed from various locations of duct line of Smelter plant 3 due to leakages in duct line. To rectify all leakages to avoid fugitive emissions.	The duct line in the smelter plant-3 has been revamped and provided with new ESP. During visit, no fugitive emission observed from the duct line of Smelter plant-3.
22	Actual Results of parameters like PM and SO_2 are not reflected in OCEMS of stacks of Smelter plant 3. Hence, frequent calibration of OCEMS provided in different Stacks should be done.	All the OCEMS provided with various stacks including OCEMS provided with stack of Smelter are calibrated and found working during inspection.
23	Evaluate the efficiency and adequacy of all provided ESPs.	The efficiency and adequacy evaluation of the ESPs of CPP-1 & 3 plants has been carried out by an expert agency, M/s Soil & Enviro Industries Ltd. As per their recommendation, for all the three boilers High Frequency Transformer (HFTR) and replacement of selected collecting plates in some fields were carried out through an agency namely M/s Ador Powertron.
24	DAP and H_3PO_4 plants are closed since April 2020 for carrying out modification work. Submit time bound action plan for modification/upgradation of DAP and H3PO4 plants.	DAP and H_3PO_4 plant are permanently closed. It is informed that they have decided to dismantle these plants. Cooling towers of H_3PO_4 plant has been dismantled completely.
25	To implement coal handling guidelines properly for coal storage yard. Also submit time bound action plan for the same.	Unit has provided covered conveyor system for transportation of coal and also provided Bag filters at Conveyor junction towers (3 nos.) and at crusher (1 No.). Carrying out dust suppression using mobile mist canon in the coal yard area. Provided garland drain around the coal yard & roads beside coal handling area has been converted to concrete roads. Further, unit has provided wind screens at all sides of the coal handling area. The unit has provided peripheral sprinklers and a dry foggers machine in the coal yard Unit has also provided tyre washing facility with catch pit to collect tyre washed wastewater.
26	Regular water sprinkling should be carried out in construction area to prevent dusting.	During inspection no construction activity is going on.
27	Copper slag and C&D waste is observed being dumped in open land area (16 -hectare area)	All the previously observed copper slag and C&D waste dumped in open land of 16-hectare area are completely shifted to dedicated storage area.

	located north side of Smelter plant 3.	The 16 Ha land has been cleared and the unit has started plantation in the said area.
28	Copper slag is observed being dumped in about 10-meter width area of Reserved Forest, along the boundary wall of factory premises, behind the 16- hectare land area. Leachate wastewater is observed being accumulated in Reserved forest area in the form of small wastewater pondings, generated due to previously discharged wastewater and dumped copper slag. Whitish spot due to salt precipitation is observed in huge area of Reserved forest.	The copper slag which was dumped earlier by the unit in forest area is still lying there. Also, shallow ponding of water observed at two locations in the said forest area during the visit. Water samples collected from the said two locations. During the visit, the soil samples were collected at seven different locations in the reserved forest area and from one location in the 16 Ha land of factory premises to assess the probable contamination of the area due to dumping of copper slag by the industry. Two samples collected from each location. One sample collected at the depth of 0.5m and another sample collected at a depth of 1.5m from the ground level as per the sampling protocol for the screening of contaminants wrt contaminated sites (mentioned in the Reference Document on Identification, Inspection and Assessment of Contamination sites prepared by CPCB in June 2020 based on the guidance document for assessment and remediation of contaminated sites in India, issued by MoEF&CC). The samples were collected in presence of representative of Forest Department, Government of Gujarat.
29	To ensure preventive and corrective actions to prevent any seepage/discharge of wastewater or dumping of any solid waste in Reserved Forest area and CRZ area.	Unit has constructed boundary wall around the premises of the unit. Also, provided proper drainage system and piping network to prevent seepage of wastewater and to prevent dumping of solid waste in the adjacent forests area or any other open area.
30	To furnish the details about utilization of copper slag in road construction in Dahej GMB port area and also give clarification about the same.	As per detail furnished by the unit, they have supplied total 79658.95 MT of copper slag to M/s Sterling Port Ltd., Dahej during 2009-11. It is understood that M/s. Sterling Port Ltd. has utilized the purchased copper slag for road construction for their proposed jetty. During the present visit, it is observed that the road construction activity of the proposed jetty has been abandoned half-way and mangroves developed densely in either side of the said abandoned road. Further onwards the unit has not supplied any copper slag to M/s. Sterling Port Ltd.
31	Green belt and plantation area should be developed in periphery of factory premises to control dust emission.	As informed by the industry, they have developed about 117 ha green belt area out of total 342 ha of their premises. Recently they have started planting saplings in 16-hectare area along boundary wall within the premises.

7.0 FINDINGS AND OBSERVATIONS MADE DURING THE VISIT OF THE JOINT COMMITTEE

The findings and observations made by the committee as per the sequence of the visit to the site carried out during 30.03.2022 and 31.03.2022 are given below:

7.1 VISIT TO 16 HECTARE AREA OF THE UNIT AND THE ADJACENT FOREST AREA

After the presentation made by the unit to the committee during the visit, the committee visited the 16 Ha land area which was acquired by the unit from the Forest department during 2015-16. The committee members reached the northern boundary of the plant to have a landscape view of the forest area over the boundary wall. An elevated platform was provided by the unit within the premises at the northern boundary area for panoramic view of the forest and catchment area. Photograph of the provided platform is given below. The low lying area in the forest area to the north of the 16 Ha land was found dry during the visit except a small puddle. Photograph of the same and photograph of the forest area taken from the platform during the visit same are given below.

The viewing platform provided by the unit in the northern boundary in the 16 Ha land

	
Dry Forest area except one small puddle	*Completely Dry land*

It is understood that during 2009 heavy monsoon, water run-off incident happened at M/s. Hindalco Industries Limited during which the runoff occurred from the unit to the low-lying catchment area of the forest at northern boundary. As the 16 Ha land was under diversion during that time, boundary was not defined and only security fencing was in place. It was informed by the unit that copper slag would have been used near fencing area to contain the monsoon run-off. The unit had applied for 16 Ha land diversion in the year 2006 to Department of Forest, Government of Gujarat. During the visit of Forest Department in the year 2009, observation was made for water runoff in forest land. The letter from Department of Forests dated 30.12.2009, recommended penal afforestation for about 25 Ha land including the land under diversion. Couple of incidents of water runoff also occurred in the period of 2006-2007, but mostly limited to the localised area within the 16 Ha land itself. It is understood that that historically there were two occasions, where Hindalco had to pay penal afforestation of Rs.3.5 lakhs & Rs.5.1 Lakhs. In the year 2013, the penal afforestation amount against 2009 incident was finalised by the forest department as Rs. 94.2 lacs and the same has been paid by the unit.

In the year 2015-2016 Hindalco land diversion request had been granted by the forest department. Subsequently Hindalco had constructed a solid boundary wall as per the survey result of forest department at northern periphery.

The copies of communications and other letters from the forest departments in Gujarati language are given in **Annexure-8**. The letter & other communication from the forest department are translated in English and copy of the same are given in **Annexure-9** for reference.

In past on FY11 and FY18 Hindalco had experienced higher inventory of copper slag and created additional open space on temporary basis to facilitate monthly surge and expedited sales. The space created on temporary basis on FY11 has been evacuated and SLF was constructed thereafter. Temporary copper slag stored in 16 Ha land in FY18 has also been evacuated subsequently and left over were also sold in last year.

After the survey by forest department, the unit started the construction of boundary wall in the northern direction to the 16 Ha acquired land. During construction of boundary wall, the unit have inadvertently left the copper slag which was spread across the boundary at some sections marginally and the copper slag which was beyond the boundary line.

Copper slag observed next to the boundary wall was very less and industry explained that the same was inadvertently spread in the forest area when boundary line of the unit was not defined and subsequently during the construction of the boundary wall in 2017, the unit has not taken back the slag spread along the boundary wall in the forest area. During the visit, it was observed that the copper slag was spread in the forest area along boundary wall to the length of about 100 m and width varying from 5 m to 10 m area. The photograph taken during the visit showing copper slag lying in the forest area adjacent to the boundary wall and photograph showing the plantation carried out by the unit within the premises in the 16 ha land along the boundary wall are given below.

Copper slag near boundary wall outside the premises (in the forest area)

Plantation along boundary wall within the premises

The forest area to the north of the 16 Ha land (shown in above photographs) is low lying area and acts as a natural catchment from surrounding area and doesn't have any further drainage for monsoon accumulation. Forest department mentioned that water stagnates for

almost 6 months' post monsoon. During the visit, entire area was dry except one small puddle. Some of the patches inside catchment area were found blackish and on query, industry explained that the same could be biomass out of dead algae and water born grass, grown up during monsoon.

The industry has shown intention to remove slag and remediate the affected area, if needed, at their own expenses after getting due permission from forest department. In this regard, HINDALCO has mentioned that they have been asking permission from forest department since August 2021.

The committee decided to collect soil samples in the forest land area where copper slag was found lying, mainly in the area located to northern side to the boundary wall of the industry premises. The details of the soil sampling carried out during the visit is described in subsequent section of this report.

7.2 VISIT TO STERLING JETTY AREA

At the coastal area of Bhootnath Mahadev temple, which is located to the north of HINDALCO plant, a rubble pitched road was part of complaint about disposal of copper slag at CRZ area. The said rubble pitched road and the coastline location were not approachable by vehicle and committee visited the said location through a narrow walkway passing through the forest for about 2 Kms from the Boothnath temple. The possibility mentioned was the approach road for sterling port. The approach road for proposed port was likely under construction in the year 2010-11 from Dahej GMB port area. Birla copper had mentioned that in the year 2010-11, around 79658 MT copper slag was sold to M/s. Sterling Port Ltd. for the construction activity and related sales documents were submitted to GPCB. It is understood that M/s. Sterling Port Ltd. has utilized the purchased copper slag for road construction for the proposed jetty in the past. Further onwards the unit has not supplied any copper slag to M/s. Sterling Port Ltd.

During the visit, it is observed that the road construction activity of the proposed jetty has been abandoned half-way and mangroves developed densely in either side of the said abandoned road and wild animals like Neelgai was also observed in that area. On the road,

no traces of slag were found as the top layer of the road is already rubble pitched. Besides the under-construction road, heaps of rubble were found. Photographs taken during the visit showing the abandoned jetty road and the densely grown mangroves on either side of the said road are given in below.

Rubble pitched approach road in abandon condition

Mangroves in the surrounding area

Mangroves on the left side of the approach road

Rubble Heaps on the sides of the approach road

Rubble heaps on the sides of the approach road

7.3 SOIL SAMPLING IN FOREST AREA

After the visit to Sterling jetty area, one team consisting of CPCB, GPCB, MoEF, NEERI and forest department members were involved in collecting soil sample from the reserved forest area at different locations. Photographs taken during the sampling of soil are given below:

Soil Sampling in forest area

The officials of CPCB & GPCB had carried out soil sampling during their visit on 18th -19th February, 2022 in the reserved forest area to the northern side of the 16Ha area of the industry to assess the probable contamination of the area due to the industrial activity. However, at that time, rain water was found filled in the low lying areas in forest located just adjacent to the boundary wall of the 16Ha land and so unable to collect the soil samples from the low-lying areas where it is said that slag dumping was exactly lying. Subsequently, during the committee's visit on 30th – 31st March, 2022, the low-lying areas in the forest adjacent to the boundary of the industry were found almost dry and having access to the

said areas and accordingly soil samples were collected in the low-lying areas under the supervision of Dr. KV George from NEERI. The analysis results of the soil samples and the damage cost assessment due to soil pollution are given in details in subsequent section of the report.

The soil sampling for the chemical species determination, specifically metals was carried out at 9 locations in the alleged slag dumping area in the reserved forest located north to the factory premises. One sample was collected far away (native soil near Bhoothnath Temple) from the dumping area so as to establish the control site. The soil samples were collected at top and at the depth of 0.5 m. The collected samples are analysed at the laboratory of NEERI, Nagpur.

During field survey it is realized that the area where slag was dumped, is a low lying area and the surface run-off during rain accumulates in this region. As per the records, copper slag was lying in the area along the boundary wall for a distance of about 150 m and a width of 100 m (including the spreading in the low lying area) in the forest area. However, as a precautionary measure, the area from boundary wall up to the dry patch, where water is accumulated during rain is considered impacted. The identified area is marked on Google map and given in image below:

Image: *Likely contaminated area near the boundary wall of plant marked on Google map*

The soil sampling for analysing the different chemical species content was carried out in the dumping area where the copper slag was dumped and the above identified area marked on Google map which is considered as impact. The analysis results of the soil samples are considered for calculating the damage cost assessment of the soil pollution caused by the industry due to dumping of copper slag in the forest area. The analysis results and the damage cost assessment due to soil pollution is given in details in section 10.1 of the report.

7.4 VISIT TO GMB PORT AREA

During the visit in this area, mangroves were found dense and healthy. Photographs are as below:

Dense mangroves in the GMB port area

From GMB area, the abandoned under-construction road to proposed sterling jetty was accessed. The road construction job was suspended after application of sub-based layer prepared by mixing fly ash and copper slag. About 400m length of incomplete under-construction road was inspected. Beside the road, heaps of fly ash and copper slag mix were found during the visit. The photograph of the same is given below:

Incomplete road in the GMB area with heaps of fly ash & copper slag mix

The road is separated from bhootnath temple side sterling port road due to passing of creek. In the creek, hume pipes and rubbles filling are partially executed for continuous road connectivity and suspended mid-way. The photographs of incomplete job are as below:

Photogrpahs taken at GMB area showing incomplete road and heaps of rubbles

It was apparent that copper slag has been utilised as per its intended use and practice. No details are available with the company.

7.5 VISIT TO CAPTIVE JETTY OF M/S HINDALCO INDUSTRIES LIMITED

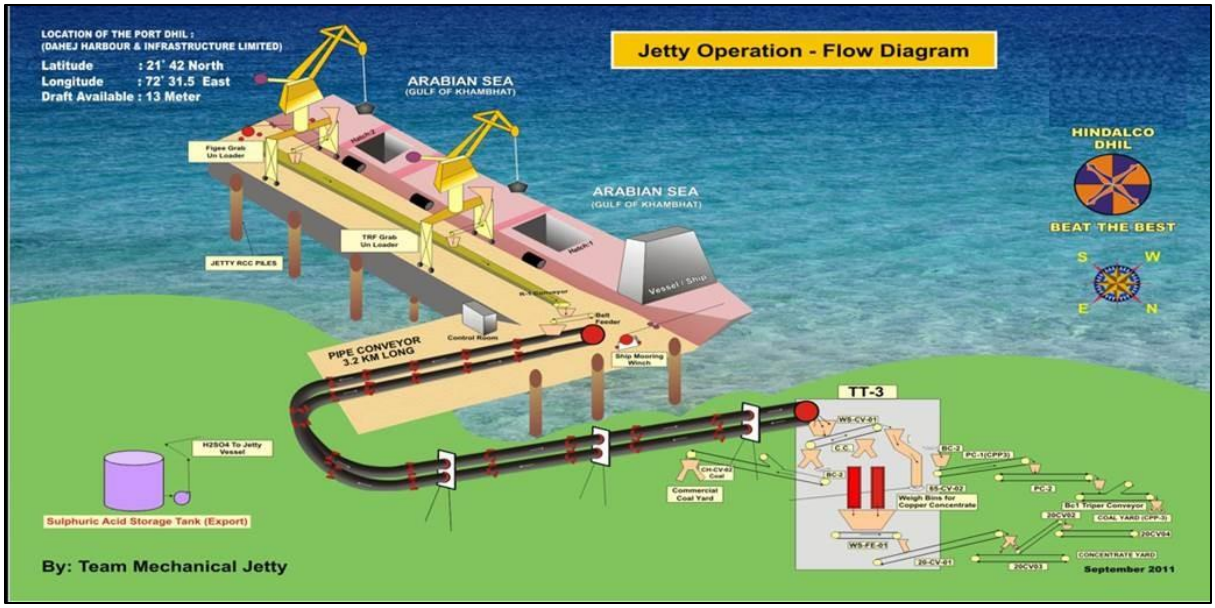
Dahej Harbour and Infrastructure limited (DHIL) is situated on the east side of the Gulf of Khambhat in the Arabian Sea, in Gujarat. It provides a single berth for ships of 11,000-70,000 DWT, with maximum permissible draught of 13.0 metres. It is connected to dry land by concrete pile support pier and 1.3 km road, running east-west.

DHIL handles wider range of bulk, break bulk and liquid cargo, such as Copper Concentrate, Coal, Sulphuric Acid, etc. This is an all-weather port working all round the year.

The jetty is 210 m long and 24 m wide. The berthing face of the jetty is 129.4 m. Face of the jetty is protected by 4 x 6 air filled yokohoma fenders. Ships can also berth either on port side or on STBD side. Berthing and unberthing of vessels takes place during slack waters.

DHIL port has 2 tugs of 3200 BHP each to assist vessels berthing / un berthing during slack water only, in an open to sea approach.

DHIL port has installed 4 shore mooring winches of 120 tons pull capacity. The shore mooring lines are passed to ships in addition to ship's ropes to keep vessel alongside in strong tidal currents. This system has been found very effective in stopping the surging of vessels in monsoons also.



Captive Jetty Process Flow Diagram

The committee visited the captive Jetty and industry has explained the overall material handling process at jetty. Currently, material such as Copper Concentrate, Coal & Sulphuric Acid are being handled. The committee has observed pipe conveyor is being used for transporting solid material which is environment friendly and avoids fugitive emissions. The committee observed the RO reject line which is being used for deep sea discharge and the plant team explained about its working, and final discharge point is as per NIO study.

After the visit to Jetty, committee went to observe the CRZ area through a high platform made by the industry on the approach road to Jetty, Healthy mangrove vegetation was observed on both sides of the approach road. The following are the photographs taken during Jetty Visit:

View platfoprm provided in the Jetty approach road

Jetty approach road and densely grown mangroves adjacent to the approach road

View from Jetty approach road showing mangroves growth

7.6 VISIT TO PRECIOUS METAL RECOVERY PLANT

PMR plant produces Gold & Silver from Anode Slime produced from Refinery plant. The technology for PMR plant is taken from reputed technology supplier, Outokumpu Engineering Contractors, Finland. During manufacturing of Gold & Silver, Selenium & Platinum Group Metals (PGM) are obtained. There are basic four steps for extraction of precious metals (Gold & Silver) from Anode slime as under.

Anode slime from the Refinery is fed into Selenium roasting furnace. The roasted slime is smelted batch wise in a rotary type of Dore furnace (commonly called TROF converter) and cast, known as Dore anodes. These Dore anodes have 99% content as Gold and Silver. The residue remains after production of Dore anode is called Dore slag.

Dore anodes are electrolytically processed in Moebius cells to separate Silver from Gold and Platinum Group metals. Silver dissolves in the silver nitrate electrolyte and deposits as crystals, which is scrapped from the steel cathodes. Gold sand containing Gold, platinum metals are collected in bags which surrounds the cast into Silver ingots (99.9 %).

Gold sand is leached with concentrated hydrochloric acid & Hydrogen peroxide. The leaching product AuCl3 is transferred for gold precipitation. Soluble Gold solution (AuCl3) is precipitated as fine gold powder of 99.99% purity, using Sodium Meta bisulphite as a reagent. The Gold powder is then filtered, washed, dried, melted and cast into Gold Biscuits (99.99 %).

The committee visited the PMR plant where the unit explained about the operations of precious metal plant and samples of finished goods were also shown.

7.7 VISIT TO SECURED LAND FILL SITE

Sludge which is generated in effluent treatment plant is sent to the secured land filled site for the disposal. Currently SLF-8 is under operation. The industry has explained that SLFs are designed as per the CPCB guidelines by National Productivity Council, Gandhinagar, Guajarat. The SLF is provided with double liner protection, leachate collection system and monitoring well. The waste water (Leachate) generated from SLF is collected and transfered to ETP for treatment and recycling.

SLF Process stage

Photograph of SLF Site (SLF-8)

Approach road for SLF-8 area

On 31-03-2022, committee visit started from SLF-8 site. The industry has explained the design and construction of the SLF. It was also informed that the design of the SLF is from National Productivity Council, Gandhinagar and during last visit of CPCB and GPCB, leachate samples were collected. On inquiry, it has been explained that leachate is collected in leachate sumps and transferred to ETP plant for recycling using tankers. The committee has asked the industry, as to what happens in case of heavy winds during summer and what is done to suppress the dust. The committee also suggested to use leachate from collection sumps for dust suppression instead sending back to ETP, if extra water is needed, use ETP treated effluent for sprinkling. This will save water, and leachate reuse will happen.

7.8 VISIT TO BORE WELL NEAR SLF-7

The committee has visited borewell no.5 near SLF-7 area. The industry explained use of bore wells, sampling, analysis, and monitoring of ground water. The committee has asked reason of low TDS in borewell no.5. The industry stated that Lakhigam canal can be the reason for low TDS which is passing through the area adjacent to the borewell no.5. Further, the committee has asked industry to study the seasonal variation in sampling results (TDS and others) specially before and after monsoon.

Approach road to SLF area

Borewell no.5 near SLF 7 area

7.9 VISIT TO PHOSPHOGYPSUM YARD

The phosphogypsum yard is utilized for storage of phosphogypsum which is generated during the operations of phosphoric acid plant. The phosphogypsum contains moisture which comes out in the form of leachate which is collected in leachate sumps in the yard and recycled back into the process. The phosphogypsum yard is having impervious liner with leachate collection system.

The phosphoric acid plant is stopped, therefore there is no generation of phosphogypsum. The phosphogypsum stored in yard is completely covered with HDPE liner. The old stock of phosphogypsum is being sent to cement industries and sent for fertilizer use. Presently, unit has stock of 12,00,000 MT of phosphogypsum sludge, which is completely covered with HDPE liners.

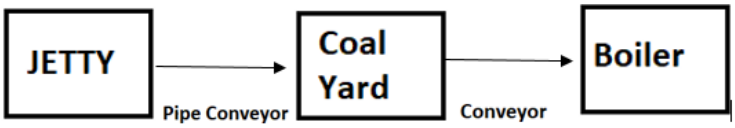
The industry has briefed about the discontinuation of fertilizer business. The Industry has also explained about their plans for strategic evacuation and selling of phosphogypsum to cement manufacturers (mainly UltraTech). The committee has suggested to industry to fully remove the phosphogypsum and use fly ash to level the ground. The Industry has explained how they handled the phosphogypsum during heavy monsoon rains and storm. The committee asked about the material used as weight on tarpaulin to cover phosphogypsum should not contaminate the water during monsoon. The industry explained that it is copper slag filled in bags.

Photograph of Phospho-gypsum yard

7.10 VISIT TO COAL YARD

The industry uses imported coal(mostly south african) which comes through ship to jetty. The coal is transported from Jetty to Coal yard through Pipe Conveyor and stored in coal yard from where coal is fed to boiler bunkers through belt conveyors after crushing and screening. During unloading of coal, central water sprinkling system is installed to prevent fugitive emissions during unlaoding. The 4 numbers of Bag filters are installed at transfer

points. The wind screen is installed in periphery of coal yard along with the water sprinkling system to mitigate the fugitive emission.



Coal Yard

Closed conveyor system and bag house in coal yard

Wind Screen

Bag Filter

Peripheral water sprinkling system

Central Sprinkling System

Fogging Gun

Battery operated sweeping machine

Coal yard peripheral drain

Coal Catcher

The Committee has visited coal yard after phosphogypsum yard. At the yard entry, the committee has discussed about vehicle wheel wash practice and gave example of TSDF site. The discussion happened on the type of coal used, presence of shells or igniting elements present in coal, wind screen project etc. The Industry showed working of newly deployed mist cannon machine for coal dust suppression and mobile vacuum cleaner for ground cleaning. The coal stored in coal yard was covered in Tarapulin. The industry has also installed water fogging system to prevent fugitive emission during loading and unloading. The Committee has asked which type of water is being used for water sprinkling and dust

suppression and the industry informed that recycled water is being used for dust suppression. The Industry informed that they recover around 200-250 kg of coal dust per day from the catchment and recycle it during monsoon.

Demonstration of water fogging system during the committee visit

7.11 VISIT TO TWRU PLANT

The reject water from existing Reverse Osmosis plant which goes to sea, will be treated in Tertiary Water Recycling Unit (TWRU). The TWRU has pre-treatment section which has soda lime treatment to remove the hardness. The thickened sludge is separated through filter press and send to SLF for disposal.

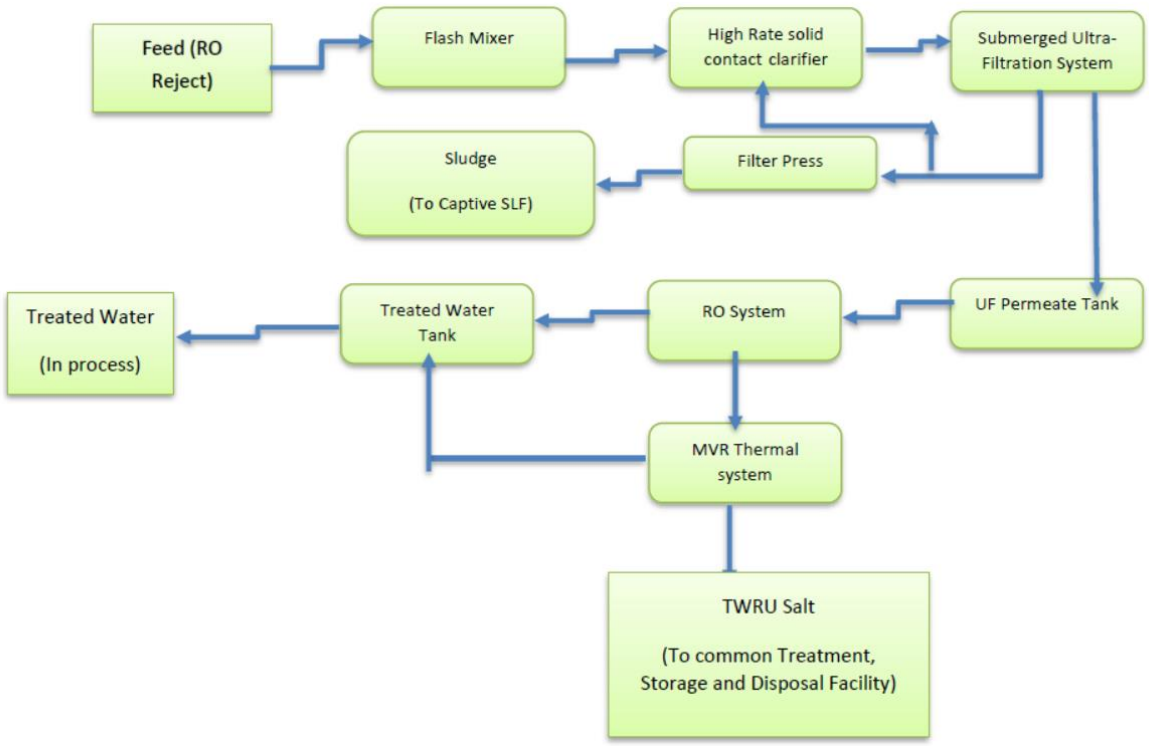
The overflow from the thickener passes through submerged Ultra Filtration membranes. After that, it is passed through sea water membranes. The permeate from membrane is recycled back to plant while reject is condensed into salt through evaporator. The evaporator initially needs steam to heat up and then vapour compressor keeps the temperature and salt is precipitated from evaporator.

TWRU Plant

Evaportor in the TWRU plant

TWRU plant

TWRU plant



TWRU Process Flow Diagram

From coal yard, the committee has visited Tertiary water recycling unit. The industry explained process of TWRU, technology, capacity etc. The committee also discussed about end use of TWRU salts generated during process, operation cost benefits in current technology vs conventional treatment facilities. The industry further showed equipment and design safety measures taken in installations.

7.12 VISIT TO FERTILIZER PLANT

Phosphoric acid and Ammonia are reacted in a pipe reactor to obtain Ammonium Phosphate slurry at a temperature of around 1350^{o}C and 8 % moisture. This slurry is fed to the granulator where rolling bed of granules are coated to form larger granules with a moisture content of 3-4 % at the outlet of granulator. After the process of layering and agglomeration in the granulator, the granules are sent to the drier wherein the granules are dried to a moisture level of less than 1.5%. After the drying operation, the granules are screened, and the product size is fed to the cooler in controlled way. The oversize after crushing the under-size from the screens are re-cycled back to the Granulator. The off gases from the granular, drier and cooler are scrubbed in two stages to recover all the Ammonia, P2O5, Dust, fluorine, etc. before they are discharged to the stack. Separate dust collection systems are installed for collecting the dust before going to the scrubbing system. The cooled product from the outlet of the cooler is fed to the product storage bins and then sent to Bagging plant for continuous bagging and transportation to the various consumer centres.

The industry has explained that they have discontinued fertilizer plant since April 2020 and still supplying the imported DAP product under their brand name. The industry also explained the problems of cooling towers which were leading to acidic water in drains and final outfall and showed the locations of dismantled cooling towers. The Handling of dismantled material and scrap was briefly discussed during the visit.

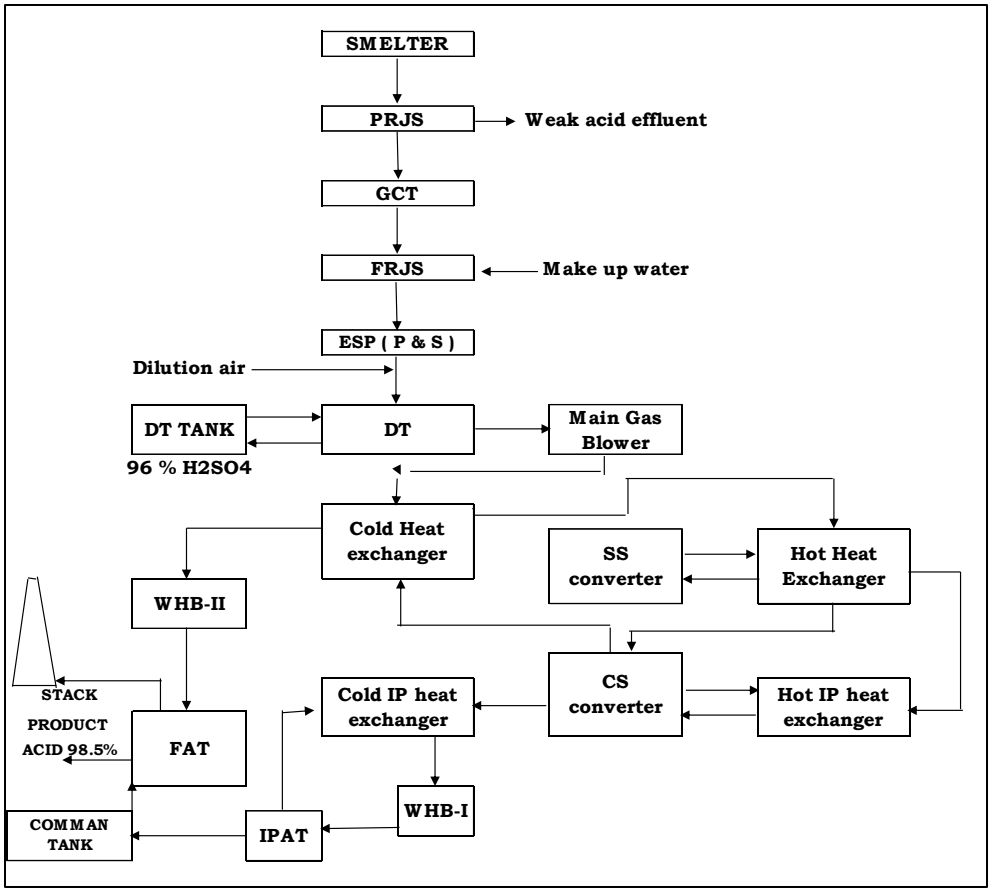
Fertilizer Plant area

7.13 VISIT TO SULPHURIC ACID PLANT

The Sulphuric Acid Plant has been built for handling SO_2 gases from Flash Smelting Furnace and PS Converters. This is a Metallurgical gas-based plant with a 3 + 2 conversion – Inter pass Absorption system.

In the Gas Cleaning Section impurities in gas are removed. The SO_2 bearing gas from the Smelter Plant enters into Primary Reverse Jet Scrubber (PRJS). Here, the gases are quenched and scrubbed by the weak acid spray. The dust, metallic fumes and mist particles are removed efficiently. After PRJS, gases pass through the Gas Cooling Tower (GCT) where it is cooled to 65^o C. Then the gases go to the Final Reverse Jet Scrubber (FRJS), where the balance impurities are scrubbed to the desired level. The gases coming out from the FRJS enter the Electrostatic Precipitators. Acid mist separation takes place in two stages of ESP's. The cleaned SO2 gases from the mist precipitators are mixed with the atmospheric dilution air and then passed through Drying Tower (DT). In the Drying Tower 96% acid is sprayed and remaining water vapour is removed here, which is not desirable for Converters.

In the Conversion Section to initiate the catalytic conversion reaction gases must be heated to auto-ignition temperature before contacted with catalyst. As the conversion reaction is exothermic, the heat of reaction is also removed before passing to the conversion bed. There are two converters of S.S (1st bed) and C.S (2nd & 5th beds). Gases after passing through first to third bed, enter to IPAT and SO_3 absorbed in 98 %. Then, remaining SO_2 in gases is again converted in to SO_3 in fourth and fifth bed and absorbed in final absorption tower.



SAP Process Flow Diagram

7.14 VISIT TO REFINERY

Raw Material for Refinery is Copper Anode, (99.5 % pure) which is received from Smelters. These anodes are processed in Anode Preparation Machine where weight & dimensions of each piece of Anode is checked. Accepted Anodes are loaded in the Electrolytic Cells at Refinery. During the process of electrolysis pure Cu ions gets deposited on Stainless-steel Blanks, acting as Cathode.

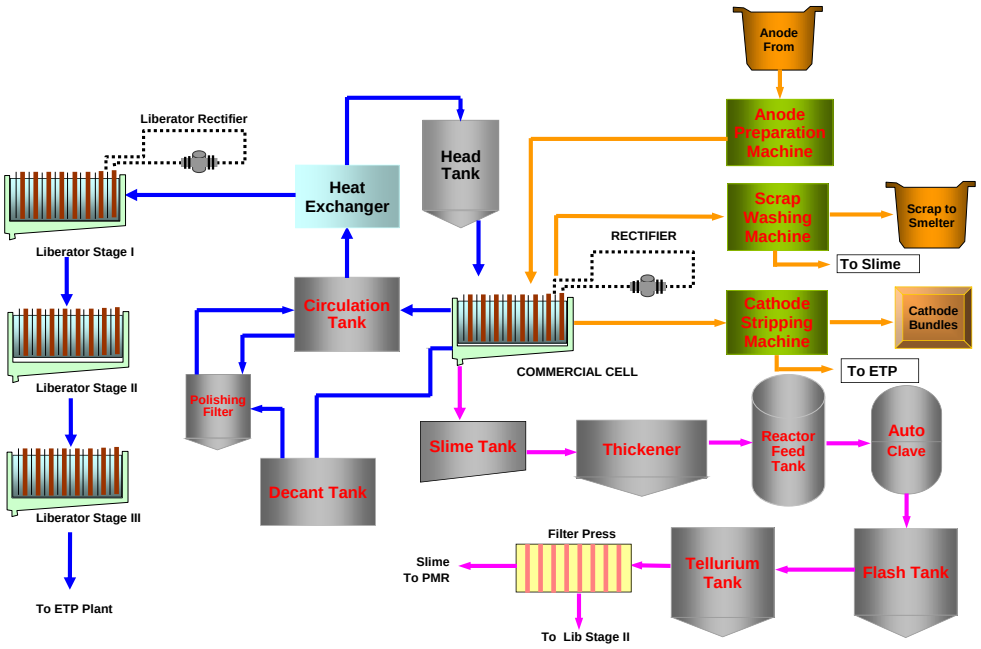
Life cycle of Anode is 21 days. From Anode, Copper is electrodeposited onto Stainless-steel cathode plate in three crop cycle, each of 7 days duration. The copper-plated cathodes are washed with hot-water sprays and the copper deposits (50 – 60 kg on each side of the blank) are machine-stripped, through the process of Flexing and Chiselling from the stainless-steel blanks. These Copper Plates are packed, strapped, and sent to market or to melting, casting, and rolling at CCR Plant. The stripped stainless-steel blanks are washed and returned to the refining cells.

During, 21 days of operation, three Crops of Cathode are recovered. Remaining part of Anode (45 -50 Kg) is taken out from the cells as Spent Anode, which being very thin and not suitable for further electrolysis operation, is returned to Smelter for recycling.

During the process of Electrolysis, flow and temperature of electrolyte is continuously maintained.

Once, life of Anode gets exhausted, after 21 days, Electrolyte is drained from the cell and the anode slimes are taken out from the bottom of the cell. The drained electrolyte is sent to filtration, storage and recycled back. The slimes are sent after filtration to Precious Metal Recovery plant (PMR) after de-copperisation through leaching process at Autoclave.

Refinery operation generates electrolyte bleed to maintain Copper concentration, and this is sent to ETP after removing Copper in three stage Liberator Operation. In 1st. stage lib cathode produced which is sold and in 2nd. & 3rd. stage Liberator Cake is produced. Liberator Cake is either remelted at Smelters or can be sold. Also, the Cu- As Precipitate which gets settled down at the cell bottom is recycled in the smelters.



Refinery Process Flow Diagram

The copper refining process was explained to the committee by head of refinery. Discussion happened about the refinery bleed, liberator section, use of liberator cake (recycling and export) and copper-arsenic sludge (Recycling and dumping at SLF). The industry also showed operation of cathode stripping machine.

Refinery section

Refinrery

7.15 VISIT TO SMELTER PLANT

Copper concentrates received from Jetty are stored in Raw material handling yard. Different concentrate transferred to bedding plant in its required proportion to make blend. Wet concentrate sent to dryer to remove the moisture. Dry concentrate further mixes with required flux (Silica) & sent to pneumatic feeding system.

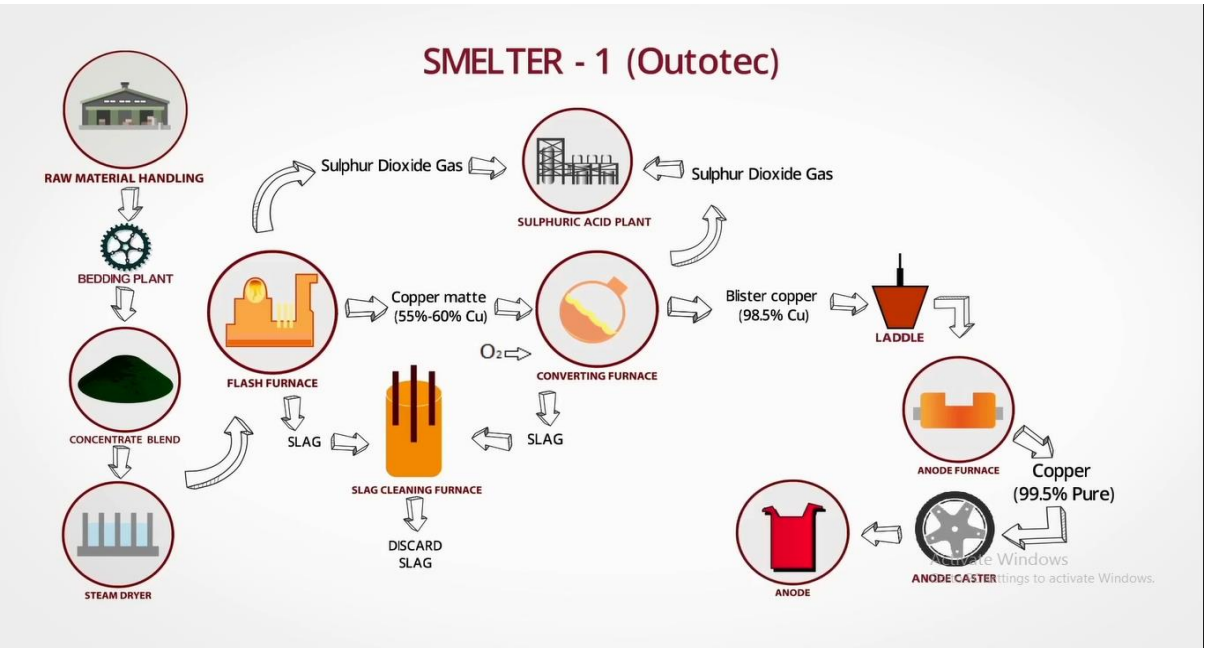
Mixture of concentrate & flux pneumatically conveyed & charged in to Smelting furnace. Oxygen enriched air is used for smelting. During Smelting iron sulphide oxidized & liberate SO2. Iron oxide combined with silica (Flux) & generate Ferro – Silicate slag. Intermediate product matte & slag transferred to cleaning furnace. Aim of slag cleaning furnace is to provide necessary residence time for good separation of matte & slag. Temperature of bath is maintained by supplying heat through two sets of three phase electrodes delta. The floating slag is discarded through granulation system & matte is siphoned to Converting furnace. In converting furnace matte converted to blister copper by injecting oxygen

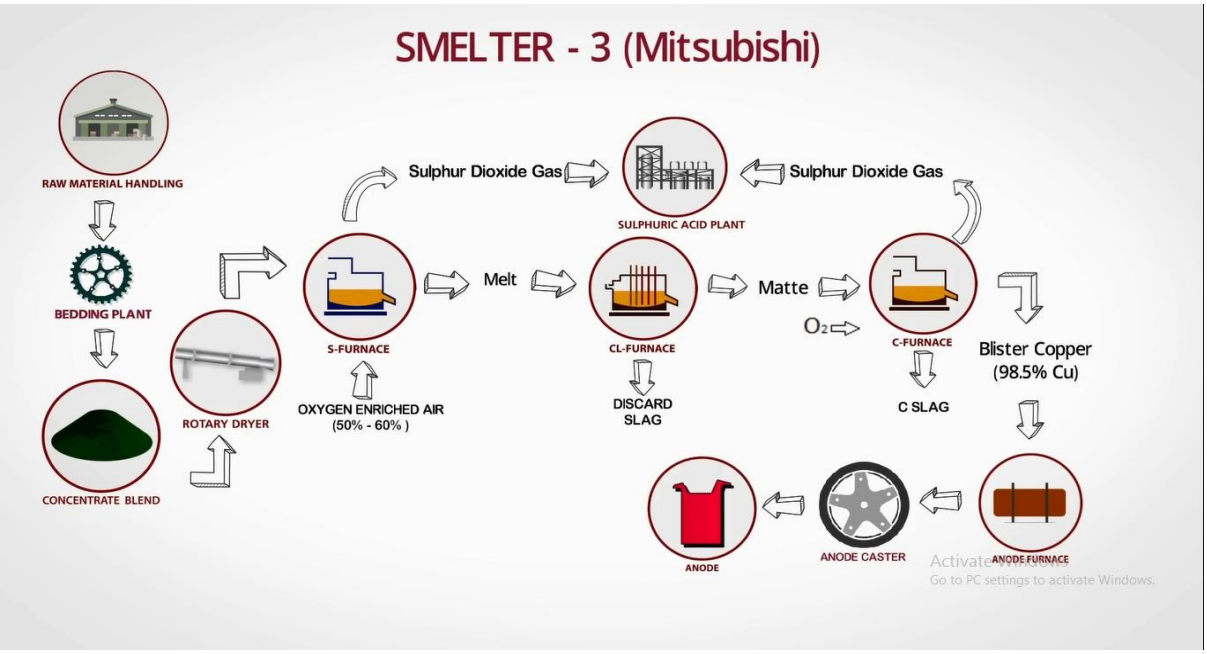
enriched air with flux (limestone) & coolant is added for temperature control. The blister copper is transferred to anode furnace.

Anode furnace refines blister copper through oxidation & reduction processes. Oxidation eliminates Sulphur by blowing oxygen enriched air. Reduction performed by blowing LNG, which kill oxygen dissolved in copper during oxidation. Final liquid copper metal is cast to anodes and sent to Refinery for further process.

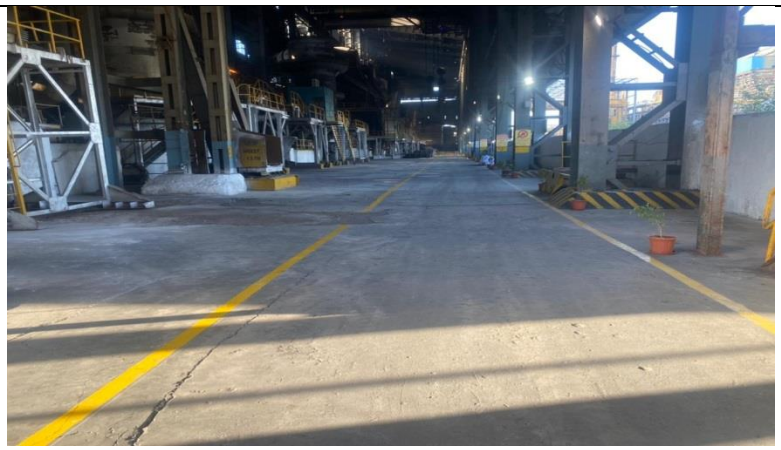
Smelting & converting process are exothermic & generate heat. Waste heat boiler use this heat to generate steam. which is sent to captive power plant after super heating. Dust generated during both processes collected in bottom of the boilers & conveyed to smelting furnace for recycling. Dust in off gas which pass through boiler is collected by electrostatic precipitator & recycled to smelting furnace. After this clean gas sent to Sulphuric acid plant.

Sulphuric acid plant converts SO2 to Sulphuric Acid through cleaning, converting & absorption processes. which is then sold in market.





From Refinery, the committee visited Smelter-1 plant where copper anode manufacturing process (smelting, converting and anode fire refining) from concentrate route was explained by the industry. Raw material, by-product (copper slag) and final anode sample were shown to the committee. End usage of copper discard slag was discussed. The committee has asked the industry to provide images of all raw materials, products and by -products with process briefs. The committee also visited anode casting area and discussed physical aspects of copper anodes and return spent anodes from refinery, casting moulds and baryte coating used during anode casting. Molten metal safety (metal splashes, leakages etc.) management was also discussed briefly with industry.



Smelter Plant-1

Smelter Plant-1

The committee discussed about newly upgraded ESPs and ducts in major shutdown during smelter-3 visit. It was explained by the industry that MoC of ESPs and ducts has been upgraded to stainless-steel construction. Working principle of ESPs, process of smelter-3 and sulphuric acid plant, characteristics of exit gas and Tail gas scrubber was briefly explained by industry. The committee has suggested to explore other by-products from SAP plant such as oleum and chloro-sulphonic acid.

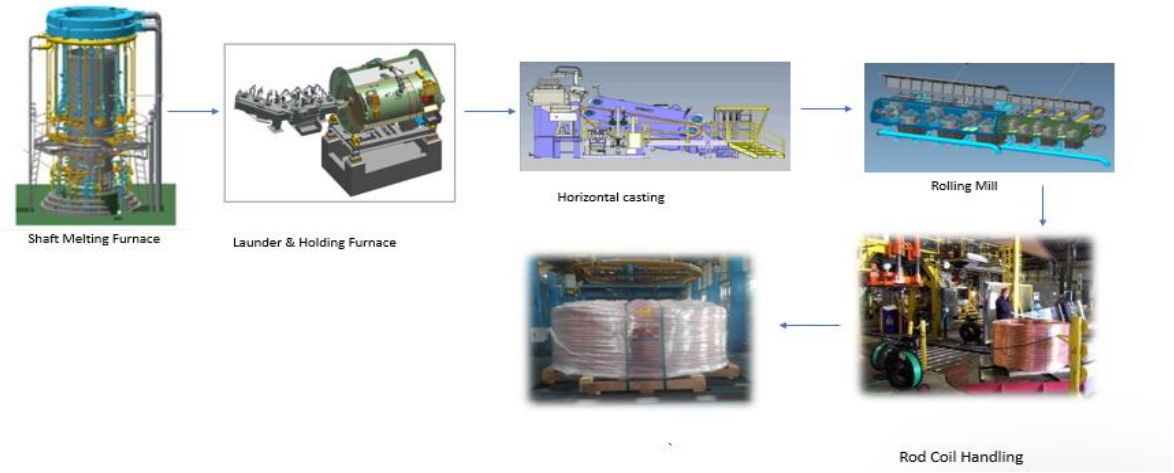
Smelter Plant-3 area

7.16 VISIT TO CONTINUOUS CAST ROD (CCR) PLANT

Copper cathodes received from Refinery plant are kept in the storage area of CCR plant. Copper cathodes are then charged into the skip hoist of the vertical shaft furnace with the help of fork lift. This furnace operates on natural gas as fuel. After melting of copper cathode in furnace, it flows into the holding Furnace, through gas fired, covered launder to compensate heat loss. During casting, holding furnace is tilted to allow the molten Copper

to flow into casting mould, which consists of a watered cooled wheel and steel belt. Molten copper metal is poured inside the casting wheel groove through fused Silica spout. In turn the solidified cast bar continuously emerges out of the wheel. The corner of the copper bar is trimmed in the bar preparation unit. The trimmed bar is then continuously rolled into 8, 12, 12.5, 16 and 19 mm diameter rods in Morgan no twist rolling mill. The copper rod is subsequently cleaned with 3 - 5 % IPA in water. CC Rods thus produced is coiled on wooden pallets and strapped for dispatch. Scrap and edge cuttings are recycled to the Shaft Furnace.

Cu Plates + Heat → Cu Coils



CCR-3 Process Flow Diagram

The committee has visited CCR-3 plant and process was explained by the industry. The industry has briefed about plant capacity and how plant product is produced by casting, moreover the committee has also visited the plant lab where the industry has showed working of Universal Testing Machine. Discussions also happened about other tests used to check product quality.

CCR-3 plant

8.0 SLAG MANAGEMENT

Copper slag or Ferro Sand is a By-product from pyrometallurgical process of copper metallurgical plant. It is a non-hazardous and non-leachable commodity and extensively used for road, construction, it is also sold to Cement Industries as Raw material, Ready mix cement as aggregate, to road & construction activities and to abrasive industries. It was informed that the annual sales of the copper slag are exposed to market conditions as PER THE demand in construction and infrastructure sector.

The unit provided the details of the copper slag generated during the period 2009 till 2021. The annual copper slag generated during the period 2009-10 till 2020-21 are given in the below table. As informed by the unit, the copper slag generated from the industry is non-hazardous and not listed as hazardous waste in the CCA. Further, copper slag is mentioned as granulated slag and listed as by-product in the CCA obtained by the industry from GPCB. Reportedly, the unit is selling the copper slag to Cement Industries as Raw material, Ready mix cement as aggregate, to road & construction activities and to abrasive industries.

Table: *Copper slag generation and sale details*

S. No.	Financial Year	Opening balance of Copper slag (MT)	Generation of Copper slag (MT)	Quantity sold (MT)	Closing balance of Copper slag (MT)	Consented Quantity (MT/A)
1	2009-2010	773179	746122	409098	1110204	786000
2	2010-2011	1110204	757476	481654	1386026	786000
3	2011-2012	1386026	766186	1055144	1097068	786000

4	2012-2013	1097068	739049	986715	849402	786000
5	2013-2014	849402	715507	1074096	490813	786000
6	2014-2015	490813	760722	655566	595969	786000
7	2015-2016	595969	778008	548957	825020	786000
8	2016-2017	825020	771614	492986	1103648	786000
9	2017-2018	1103648	**799791**	650593	1252846	786000
10	2018-2019	1252846	723105	1302845	673106	786000
11	2019-2020	673106	663500	883304	453302	786000
12	2020-2021	453302	488794	492108	449988	786000

As per the details provided by the unit, the slag generation for the financial year 2017-2018 is 799791 MT, which is higher than the consented quantity calculated annually (i.e. 786000 MT/Annum). It was informed by the industry that some copper concentrate parcels received during the year 2017-18 had lower copper percentage and higher iron content which resulted in higher generation of copper slag. As per the information submitted by the unit in Form-V (Environmental Statement) for the year 2017-18, other products are produced within the consented quantity for the said period.

The inventory movement in above table also shows the present high demand in the market mainly in the Road and construction sector results in high sale of ferro sand more than the annual generation resulting in maintaining a lower inventory level of ferro sand.

The generated copper slag is stored in the premises at designated open yard with size of about 500 m x 275m and about 13.75 lakhs MT of copper slag can be stored in the slag yard. Presently, the copper slag generation is in the about 65000MT/month, which is within the consented quantity and the generated slag are presently being sold on regular basis to outside parties, which is reflected in the sale details provided by the unit.

It was informed by the unit that during FY11 and FY18, they had experienced higher inventory and therefore created additional open space for storing copper slag on temporary basis to facilitate monthly surge. The space created on temporary basis during FY11 has been evacuated and SLF was constructed thereafter. Temporary copper slag which was stored in 16 Ha land in FY18 has also been evacuated subsequently and left over were also sold in last year.

It was informed by the unit that based on the request made by M/s. Sterling Port Limited, for construction of the approach road for their upcoming port at Dahej, the unit has supplied Copper slag to M/s. Sterling Port Limited during the FY 2010-11 & FY 2011-12. The unit had sold total 79658.95 MT of copper slag to M/s. Sterling Port Limited during the period 2010-11 & 2011-12. The monthly sale details of copper slag by the unit to M/s. Sterling Port Limited for the 2010-2011 & 2011-2012 have been provided by the unit and the same are given in below tables. The unit also provided copies of few sale invoices for the sale of copper slag to M/s. Sterling Port Limited and the same is attached as **Annexure-10** for reference.

Table: *Details of copper slag sold to M/s. Sterling Port Limited during FY 2010-11 & FY 2011-12*

2010-2011 (Qty in MT)				
Dec 2010	**Jan 2011**	**Feb 2011**	**Mar 2011**	**Total**
8347.41	18553.18	770.23	7694.58	35365.40
2011-2012 (Qty in MT)				
Apr 2011	**May 2011**	**Jun 2011**	**Jul 2011**	
13142.79	18947.73	10746.78	1456.25	44293.55
			Grand Total	**79658.95**

9.0 COMPLIANCE STATUS OF CCA

<table>
<tr><th colspan="3">Compliance of the conditions stipulated by GPCB while granting CC&A
NO: GPCB/BRCH/CCA-310(19)/ID-15178/568901/Dt 30/09/2020</th></tr>
<tr><th>Condition No.</th><th>Detail of Condition</th><th>Compliance status</th></tr>
<tr><td>1.0</td><td>Consent Order No. : AWH-108216 date of Issue 30/05/2020.</td><td>--</td></tr>
<tr><td>2.0</td><td>The consent under Water Act-1974 for conveying the industrial treated effluent discharge to deep sea, the consent under Air Act-1981 & Authorization under Environment (Protection) Act, 1986 shall be valid up to 02/03/2026 to operate industrial plant to manufacture following products:
<table>
<tr><th>Sr No.</th><th>Products</th><th>Quantity (TPA)</th></tr>
<tr><td>1.</td><td>Cathode Copper</td><td>500000</td></tr>
<tr><td>2.</td><td>Sulfuric Acid (98.4%)</td><td>1470000</td></tr>
<tr><td>3.</td><td>Oxygen (Tech)</td><td>780000</td></tr>
<tr><td>4.</td><td>Gold</td><td>26</td></tr>
<tr><td>5.</td><td>Silver</td><td>200</td></tr>
<tr><td>6.</td><td>CC Rod</td><td>484000</td></tr>
<tr><td>7.</td><td>Phosphoric Acid (as P_2O_5)</td><td>360000</td></tr>
<tr><td>8.</td><td>DAP/NPK Fertilizer</td><td>872000</td></tr>
</table></td><td>The products and by products have been produced as per consent order, which are within the limit mentioned in CCA. Form-V shows production details within consented capacity</td></tr>
</table>

	9. Electric Power (MW) — 145.60 10. Copper Wire (≤ 4 mm dia) — 60000	

Sr No.	Name of By Products	Quantity (TPM)
1.	Selenium	60 TPM
2.	PGM Concentrate	0.0508 TPM
3.	Granulated slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	Hydro fluosilicic acid	5580 TPM
6.	Aluminum Fluoride	500 TPM

	Specific conditions:	
a)	Unit shall comply with all the conditions stipulated by SEIAA / MoEF in the order of Environment Clearance issued vide letter No. J-11011/07/94-IAII(I) dated14th March, 1995, J-11011/81/2000-IAII (I) dated 08th January 2002, No. J-11011/86/2002-IAII (I) dated 10th February.2004, J-11011/220/2002-IAII (I) dated. 18th March.2005, J-11011-927/2008-IA-II (I) dated 11th February 2009, and J-11011-927/2008- IA-II (I) dated.23rd February 2017.	All the conditions stipulated by the Ministry while according environmental clearances to the existing project vide its letter no. J-11011/07/94-IAII dated 14th March, 1995, J-11011/81/2000-IAII (I) dated 08th January 2002, J-11011/86/2002-IAII (I) dated 10th February.2004, J-11011/220/2002-IAII (I) dated. 18th March.2005, J-11011-927/2008-IA-II (I)dtd.11th February 2009, J-11011-927/2008-IA-II (I) dtd.23rd February 2017 is implemented and compliance reports

		are submitted to MoEF from time to time.
b)	Unit shall sell out their hazardous waste to authorized end users who is having authorization with valid CCA and rule 9 permission to receive this waste. Unit shall make MoU with such authorized end users and submit MoU.	Hazardous waste is sold to authorized end users who is having authorization with valid CCA and rule 9 permission to receive this waste. Unit shall make MoU with authorized end users and submit to board.
d)	Unit shall install online Continuous Emission Monitoring Systems (CEMS) and link it with the server of GPCB for real time data transfer for boiler more than 8 TPH capacity or equivalent capacity of TFH.	Continuous Emission Monitoring Systems CEM is installed and is linked with CPCB server for real time data
3.0	**CONDITIONS UNDER THE WATER ACT**	
3.1	The quantity of total water consumption shall not exceed 39742 KL/Day as per below break up as mentioned in form D submitted for consent application under the Water Act-1974. a) Industrial: 38524 KL/Day b) Domestic: 1218 KL/Day	The quantity of total water consumption is remaining in range of 22000 to 25000 KL/Day which is below the limit as prescribed by the board.
3.2	The quantity of total waste water generation shall not exceed 5161 KL/DAY as per below break up as mentioned in form D submitted for consent application under the Water Act-1974. a) Industrial: 4755 KL/Day (Including R.O reject 1000 KL/day) b) Domestic: 406 KL/Day	The quantity of industrial effluent is remaining in range of 3300 – 3500 KL/day which is below the limit as prescribed by the board.
3.3	**Mode of disposal of wastewater:**	
a)	The treated effluent conforming to the above standards as per condition no.3.4 shall be reutilized as per specific condition no. (III) of Environment Clearance Certificate dated: 18/03/2005 i.e. unit shall use 1330 M3/Day of treated effluent for greenbelt development. 475 M3/Day of treated effluent for lime slurry preparation. 480 M3/Day of treated effluent for make up in slag granulation and remaining 370 M3/Day of treated effluent in gas cleaning section. However, additional treated effluent or during the rainy season. Effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO specifically for the effluent generated from copper smelter Plant I & II. There shall not be any discharge outside the premises for the effluent generated from copper smelter Plant-III. The treated effluent should conform to the marine environmental standards as specified as per condition	The treated effluent is being reutilized as per specific condition. Treated effluent confirms the marine environmental standards as specified by board.

<table>
<tr><td></td><td>no.3.4</td><td></td></tr>
<tr><td>b)</td><td>The Sewage from the entire complex shall be treated separately to conform to the following and utilized on land for gardening and plantation only.
<table>
<tr><th>Sr. No.</th><th>PARAMETERS</th><th>PERMISSIBLE LIMIT</th></tr>
<tr><td>1</td><td>Biochemical Oxygen Demand, BOD_3, 27^0 C</td><td>20 mg/L</td></tr>
<tr><td>2</td><td>Total Suspended Solids (TSS)</td><td>30 mg/L</td></tr>
<tr><td>3</td><td>Total Residual Chlorine</td><td>Minimum 0.5 ppm</td></tr>
</table></td><td>We have two Sewage Treatment Plant, one in Plant and another in Township having capacity 500 KLD and 800 KLD respectively. The sewage from the entire complex & Township is treated and conforms to the standards specified by GPCB it is used for gardening and plantation only.</td></tr>
<tr><td>c)</td><td>The company should operate a separate online Fish pond using treated effluent to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to the Ministry’s Regional office at Bhopal/CPCB/GPCB.</td><td>A separate online fish pond using treated effluent is operated to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point is monitored periodically by an independent agency authorized by CPCB and reports of the independence agency and reports are submitted to the GPCB & MoEF.</td></tr>
<tr><td>d)</td><td>Adequate facilities and safety measures including protective clothing for personnel working in the critical area. e.g. in the anode casting area must be strictly explored.</td><td>Adequate facilities and safety measures including protective clothing’s, hand gloves, gumboot, eye goggles, full body mask apron for personnel working in the critical areas are provide. Specially in anode casting area fire protective suite and nose mask and eye goggles have been provided.</td></tr>
<tr><td>3.4</td><td>The quality of industrial effluent shall conform to the following standards (as per GPCB norms, whichever is applicable) (additional treated effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO)
<table>
<tr><th>Sr. No.</th><th>PARAMETERS</th><th>PERMISSIBLE LIMIT</th></tr>
<tr><td>1</td><td>pH</td><td>5.5-9.0</td></tr>
</table></td><td>The industrial effluent confirms to the standards specified by GPCB and analysis reports are submitted to GPCB on monthly basis.</td></tr>
</table>

		2	Temperature	45°C		
		3	Colour(Pt,Co.scale)	100 units		
		4	Total suspended solids	100 mg/l		
		5	BOD(3 days at 27o C)	100 mg/l		
		6	COD	250 mg/l		
		7	Oil and Grease	20 mg/l		
		8	Phenolic Compounds	5 mg/l		
		9	Ammonical Nitrogen	50 mg/l		
		10	Sulphides	5 mg/l		
		11	Cyanides	0.2 mg/l		
		12	Fluoride	10 mg/l		
		13	Hexavalent Chromium	1.0 mg/l		
		14	Total Chromium	2.0 mg/l		
		15	Copper	3.0 mg/l		
		16	Nickel	5.0 mg/l		
		17	Zinc	15.0 mg/l		
		18	Mercury	0.01 mg/l		
		19	Lead	1.0 mg/l		
		20	Arsenic	0.2 mg/l		

	<table><tr><td>21</td><td>Cadmium</td><td>2.0 mg/l</td></tr><tr><td>22</td><td>Insecticide/Pesticide</td><td>Absent</td></tr><tr><td>23</td><td>Selenium</td><td>0.05 mg/l</td></tr><tr><td>24</td><td>Bio-Assay Test</td><td>90 % survival of fish after 96 hours in 100 % effluent</td></tr></table>	
3.5	Unit shall install continuous / online monitoring system and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as pH, BOD, COD, TSS, other sector specific parameters etc. with recorder & magnetic flow meters for flow measurement of treated wastewater as per CPCB guideline.	Unit has installed continuous / online monitoring system and its data are transmitted online to CPCB/GPCB for the parameters such as BOD, COD, TSS. Data are recorded & waste water flow is measured with magnetic flow meter as per CPCB guideline.
3.6	Unit shall make fixed arrangement for discharge of the effluent from their Final collection tanks. Unit shall not keep any by-pass line or system or loose or flexible pipe line for discharge of the effluent into underground drainage network of Pipeline.	Unit has made fixed arrangement for discharge of the effluent from final collection tank i. e RO Reject tank.
3.7	Magnetic flow meters shall be installed at the inlet & outlet of effluent collection tanks/ETP to measure the quantity of effluent.	Magnetic Flow Meters is installed at inlet and outlet of Effluent Treatment Plant .
3.8	Unit shall affix of water meters as per Section 4 (1) of the water (Prevention and Control of Pollution) Cess Act – 1977 for the purpose of measuring and recording the quantity of water consumed at such places as may be required	Complied
3.9	Unit shall provide adequate / safe effluent sampling facility for the effluent being stored in final collection / discharge tank of ETP	Safe effluent sampling facility is being provided at final storage /discharge tank of ETP.
3.10	Unit shall put up at the entrance a board displaying the name of unit, particulars of the products/ process, the name of proprietor/partners /directors of the unit.	Complied.
3.11	Unit shall have to display on-line data outside the main factory gate with regard to and nature of hazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises, if applicable as per CPCB norms.	Complied.

<table>
<tr><td>3.12</td><td>Unit shall keep accurate records of quantity of production of each product, quantity of water consumption, quantity of effluent generated and consumption of electricity on day to day basis and required to submit the complied record of each month to GPCB on or before fifth day of the succeeding month.</td><td>Complied.</td></tr>
<tr><td>3.13</td><td>Disposal system for storm water shall be provided separately. In no circumstances storm water shall be mixed with the industrial effluent.</td><td>Disposal system for storm water is provided separately hence storm water will not get mixed with the industrial effluent is being taken care.</td></tr>
<tr><td>3.14</td><td>Leachate from the Secured Land Fill, if any shall also be connected into a collection tank through leachate collection facilities and shall be treated along with industrial effluent.</td><td>Leachate from the Secured Land Fill is transferred with help of pump mounted tanker and is being treated along with industrial effluent.</td></tr>
<tr><td>3.15</td><td>The Environmental audit shall be carryout yearly, if applicable. The environmental statements pertaining to the previous year shall be submitting to this State Board latest by 30th September every year.</td><td>The Environmental audit is being carried out yearly and the environmental statements pertaining to previous year is being submitted to Board before 30th September every year last environmental statements submitted to Board dated 21.07.2020.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>4.0</td><td>CONDITIONS UNDER THE AIR ACT:</td><td></td></tr>
<tr><td>4.1</td><td>The following shall be used as fuel:
<table>
<tr><td colspan="3">DETAILS PF FUEL CONSUMPTION</td></tr>
<tr><td>Sr No.</td><td>Details of Fuel</td><td>TPM</td></tr>
<tr><td>1.</td><td>HSD</td><td>900</td></tr>
<tr><td>2.</td><td>HFO</td><td>1530</td></tr>
<tr><td>3.</td><td>Imported Coal</td><td>36980</td></tr>
<tr><td>4.</td><td>LNG (SCM)</td><td>1486197</td></tr>
</table></td><td>The fuels are used as specified in the CC& A order.
The unit has stopped to use Naphta and Propane as fuel as green initiatives.</td></tr>
</table>

4.1.1	The flue gas emission through stack shall conform to the following standards	

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1).	Dore Furnace of PMR Plant	45	Bag Filter	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
2.	Package Boiler	43	Scrubber	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
3.	Sulphuric Acid Pre Heater-I	30	-	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
4.	Sulphuric Acid Pre Heater-II	30	-	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
5.	D.G. Set-I	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
6.	D.G. Set-II	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
7.	Captive Power Plant (CPP-1) CFBC Boiler 35 MW	75	ESP+ Lime dosing system	SPM SO_2 NO_x	150 mg/NM^3 600 mg/Nm3 600 ppm
8.	Shaft Furnace of CCR plant-I	26	-	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
9.	Shaft Furnace of CCR plant-II	26	-	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm

	10.	Power plant AFBC Boiler 15.35 MW (CPP -II)	60	ESP+ Lime dosing system	SPM SO_2 NO_x	150 mg/NM^3 600 mg/Nm3 600 mg/Nm3
	11.	Sulphuric Acid Pre Heater-III	38	-	SPM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm
	12.	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP+ Lime dosing system	SPM SO_2 NO_x Mercury	50 mg/NM^3 600 mg/Nm3 300 mg/Nm3 0.03 mg/Nm3
	13.	Shaft Furnace of CCR Plant-III	35	--	PM SO2 NOx	150 mg/Nm3 100 ppm 50 ppm

4.2 The process emission through various stacks/ vent of reactors, process, vessel shall conform following standards.

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1	Anode Casting	20	-	SPM SO2 NOx	150 mg/NM3 40 mg/Nm3 25 mg/Nm3
2	Main Stack Secondary Gas Scrubber	75	Two stage alkali Scrubber	SO2	40 mg/NM3
3	Copper scrap melting furnace (Cap 50 TPD)				
4	Main Stack Slag cleaning Furnace	75	Bag Filter	SO2 SPM	40 mg/NM3 150 mg/Nm3

		5	Main Stack Sulphuric Acid plant I	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2 Kg per ton of 100 % conc. Sulphuric acid	
		6	Cathode Stripping M/C plant-I of Refinery-I	20	-	SO2	40 mg/NM3	
		7	Anode scrap washing M/C of Refinery-I	20	-	SO2	40 mg/NM3	
		8	Liberator Stack of Refinery-I	26	Scrubber	SO2 Acid Mist	40 mg/NM3 25 mg/Nm3	
		9	Slag Granulation of Smelter-I	45	-	SPM	150 mg/NM3	
		10	Steam Dryer for copper concentrate of Smelter-I	58	Bag Filter	SPM SO2	150 mg/NM3 40 mg/Nm3	
		11	Slag Cleaning furnace (By pass Vent) of Smelter-I	46	Bag Filter	SPM SO2	150 mg/NM3 40 mg/Nm3	
		12	Cathode Stripping M/C plant-II of Refinery-II	20	-	SO2	40 mg/NM3	
		13	Centralized Scrubbing System Smelter-III	75	Bag Filter +Alkali Scrubber	SPM SO2	150 mg/NM3 40 mg/NM3	
		14	Sulphuric Acid Plant-III	75	5 stage DCDA system & Mist Eliminator Tail Gas Scrubber based on Dyna wave scrubber	Acid Mist SO2	25 mg/Nm3 1.0 Kg per Ton of 100 % conc. Sulphuric Acid	
		15	Cathode Stripping M/C Refinery-III	20	-	SO2	40 mg/NM3	
		16	Liberator Stack of Refinery-III	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3	

		17	DAP Plant	60	Dual media scrubber	SPM SO2 NOx NH3 HF	150 mg/NM3 40 mg/Nm3 25 mg/Nm3 175 mg/NM3 6 mg/Nm3
		18	PS Convertor area (Gases are to be transferred to H2SO4 plant) only emergency vent	47	--	PM SO2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg / Nm3
		19	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6 mg/Nm3
		20	PMR Plant Phase -III	30	Bag Filter	SPM SO2 NOx	150 mg/NM3 40 mg/Nm3 25 mg/Nm3

4.3	The concentration of the following parameters in the ambient air within the premises of the unit shall not exceed the limits specified hereunder. **Sr. No.** / **Parameters** / **Permissible Limit (microgram /m^3)** — **Annual** / **24 Hours Average** 1. Particulate Matter (PM_{10}) — 60 — 100 2. Particulate Matter ($PM_{2.5}$) — 40 — 60 3. Oxides of Sulphur (SO_x) — 50 — 80 4. Oxides of Nitrogen (NO_x) — 40 — 80	Ambient air quality is monitored within the premises of the unit on regular basis. The concentration of the specified parameters in the ambient air remains within the standards prescribed; monitoring reports are submitted to the board on monthly basis.
4.4	Unit shall operate industrial plant / air pollution control equipment very efficiently and continuously so that the gaseous emission always conforms to the standards specified as above.	Industrial plant / air pollution control equipment is efficiently and continuously operated so that the gaseous emission always conforms to the standards specified

		by the Board.
4.5	The consent to operate the industrial plant shall lapse if at any time the parameters of the gaseous emission are not within the tolerance limits specified as above.	Parameters of the gaseous emission are monitored on regular basis and report are being submitted to board. No parameter specified in consent to operate lapse.
4.6	Unit shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.	Permanent stair case with sufficient capacity monitoring platform to all monitoring stacks have been provided along with Sampling portholes, etc for monitoring air emissions.
4.7	Unit shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB(a) during day time and 70 dB (A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.	All adequate measures for control of noise levels from its own sources within the premises. The noise level is observed < 75 dB in day time 6.0 Am to 10.PM and < 70 dB in night time 10.PM to 06.AM within plant premises.
4.10	Unit shall install continuous / online monitoring system in the stacks and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as PM, SO2, NOx, other sector specific parameters etc., if applicable as per CPCB guideline.	Unit has installed continuous / online monitoring system in the stacks and data are being transmitted online to GPCB and CPCB for the parameters such as PM, SO2, NOx, as per CPCB guideline.
6.	**AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 3 (c) & 5 (5)).**	
6.2	**M/s. HINDALCO INDUSTRIES LTD**. is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT No.2,10,11,43,** AT &PO DAHEJ, LAKHIGAM, TAL.VAGRA, **GIDC ESTATE DAHEJ, DIST: BHARUCH.**	

Sr. No.	Name of Hazardous Waste	Category Number	Quantity	Facility
1	ETP waste sludge & Scrubber waste (Sludge & Filter cakes)	8.2/I	175095 TPA	Collection ,Storage, transportation and disposal at own SLF site/ common TSDF of BEIL.

		2	Arsenic bearing sludge, As-Cu precipitate	7.3/I	270.80 TPA	Collection in closed stainless steel vessel, recycle & treatment /encapsulation & disposed at own SLF site/ common TSDF of BEIL.	
		3	Used oil	5.1/I	50 KL/Yr	Collection, storage, transportation and disposal by sale to registered re -refiners	
		4	Spent Electrolyte solution	8.1/I	52560 KL/Yr	Collection, Storage, Transportation and recycle in smelter or sell to recyclers	
		5	Residue dust from SAP	17.1/I	12 TPA	Collection, Storage, Transportation & Disposal in furnace or into own SLF site / third party TSDF	
		6	Spent catalyst	17.2/I	160 KL/Yr	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL	
		7	Used Empty Drums(Empty barrels/ Containers/ liners contaminated with hazardous chemicals /wastes)	33.1/I	200 TPA	Collection, Storage, Transportation & Disposal in furnace or into own SLF site	
		8	Flue gas cleaning residue (Exhaust air /gas cleaning residue)	35.1/I	864 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / third party TSDF	
		9	Spent resin from DM plant (Spent ion exchange resin containing toxic metals)	35.2/I	7.5 KL/Yr	Collection ,Storage, transportation and disposal at own SLF site / common TSDF of BEIL.	
		10	Selenium & selenium compounds.	A-8/II	6 TPA	Collection, storage, transportation and disposal by sale to actual users.	
		11	Silver compounds.	A9/III	6 TPA	Collection, storage, transportation and disposal by sale to actual users.	
		12	Inorganic Acid (Spent Acids)	B15/II	66960 TPA	Collection, storage, transportation and reuse to Mfg of ALF3 /disposal by sale to actual users.	
		13	Dust & Lumpy	4/IV	35000	Collection, Storage,	

			TPA	Transportation and recycle in smelter or sell to recyclers
14	Copper Converting or C-Slag	6/IV	6000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
15	Liberator cake	4/IV	3000 TPA	Collection, Storage, Transportation & recycle in smelter or sell to recyclers
16	Copper Revert	4/IV	72000 TPA	Collection, Storage, Transportation & recycle in smelter or sell to recyclers
17	Dore Slag (Slags from copper processing for further processing or refining)	6/IV	2500 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
18	Lead Anode/ Cathode	7./I	80 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers.
19	Cotton waste used (Contaminated cotton rags or other cleaning materials)	33.2/I	15 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.
20	Used Insulation	X-X02	100 TPA	Collection, Storage, Transportation & Disposal in furnace or into own SLF site / common TSDF of BEIL.
21	Discarded PPE (Rubber)	X-X08	5 TPA	Collection, Storage, Transportation & Disposal in furnace or into own SLF site / common TSDF of BEIL.
22	Used membrane/ Filter cloth and bags	Z-Z37	20 TPA	Collection, Storage, Transportation & Disposal in furnace or into own SLF site / common TSDF of BEIL.

10.0 ENVIRONMENTAL DAMAGE COST ASSESSMENT DUE TO POLLUTION CAUSED BY INDUSTRY

The damage cost assessment for the pollution caused by the industry was carried out by NEERI for the compliance of order of Hon'ble NGT order. The damage cost assessment due to soil pollution caused on account of dumping of copper slag and damage cost assessment due to pollution caused by air, water and other non-compliance other than soil pollution are calculated separately and given in details in subsequent sections.

10.1 DAMAGE COST ASSESSMENT DUE TO SOIL POLLUTION CAUSED ON ACCOUNT OF DUMPING OF COPPER SLAG

The damage cost assessment for the soil pollution caused due to the dumping of copper slag in the forest area was carried out by NEERI for the compliance of order of Hon'ble NGT order.

10.1.1 METHODOLOGY

In order to calculate the external costs of pollution due to the activities carried out in the past, an impact pathway analysis (IPA) approach is adopted. The impacts are assessed by monitoring the pollutant's emissions or contamination to the media on the passage or the receptor where the damages are expected and economically evaluating the damages through the identified impacts.

In this study, the land environment damages are taken in account by the impact pathway analysis. For this, the soil sampling for different chemical species was carried out in the dumping area where the copper slag was dumped. During field survey it is realized that the area where slag was dumped, is a low lying area and the surface run-off during rain accumulates in this region. In a first look, the clean-up measure would be to remove the top soil and create a depression that would allow rain water to accumulate, which can be used by the local fauna in the vicinity. As per the records, the area along the boundary wall for a distance of about 150 m and a width of 100 m was used for slag dumping. However, as a

precautionary measure, the area from boundary wall up to the dry patch, where water is accumulated during rain is considered impacted. If the identified patch is cleaned, the area can be considered to be fully cleared of old dump and its impact. The identified area is marked on Google map and given below:

Fig.: *Likely impacted area near the boundary wall of plant marked on Google map*

The soil sampling for the chemical species determination, specifically metals was carried out at 9 locations in the alleged slag dumping area. One sample was collected far away (native soil near Bhutnath Temple) from the dumping area so as to establish the control site. The soil samples were collected at top and at the depth of 0.5 m.

10.1.2 ENVIRONMENTAL EXTERNALITIES VALUATION

Soil contaminated due to the emissions from the slag dumping may impose risk to surroundings (animals, plants etc.). The soil contamination or drivers of the impact are usually heavy metals and other chemical species in the soil and water that can showcase the impacts. As per literature, the contamination has been considered in terms of leachate discharge in many studies (ExternE, 1995). The impacts are identified based on the violation of the standards (Dutch standards) of soil quality parameters. Another way for Indian site

can be by considering the soil contamination in terms of metals concentration more than the native soil of the region. In this analysis, the impacts are quantified by measuring the difference in metal concentration between dumping area and native soil. The concentrations of elements in native soil and in the slag dumping area are given in the table below:

Table: *Element concentration (mg/kg) in Soil*

Element	**1A**	**1B**	2A	2B	3A	3B	4A	4B	5A	5B
As	0.32	0.25	2.88	3	15.26	15.6	1.34	1.36	0.92	0.95
Cu	9.86	10.08	188.12	194.94	449.93	462	258.36	259.93	43.02	45.27
Cr	0.63	0.62	0.64	0.65	0.82	0.87	0.55	0.59	0.47	0.58
Cd	0.05	0.03	1.45	1.54	4.13	4.19	0.81	0.81	0.35	0.4
Ni	0.49	0.47	0.85	0.84	1.3	1.27	1.03	1.01	0.46	0.48
Zn	1.73	1.74	17.01	17.99	31.74	32	16.37	16.63	3.91	5.11
Pb	0.29	0.26	2.3	2.02	7.32	7.08	1.36	1.36	0.69	0.68
Mo	0.14	0.04	0.65	0.62	3.93	3.71	0.79	0.75	0.14	0.17
Mn	5.32	5.38	4.74	4.73	6.94	7.01	2.87	2.9	4.68	4.7

Element	6A	6B	7A	7B	8A	8B	9A	9B	10A	10B
As	1.65	1.63	10.75	11.28	6.97	7.21	12.4	12.64	0.61	0.63
Cu	122.91	122.34	62.66	64.97	110.18	112	470.24	466.23	67.89	72.08
Cr	0.5	0.51	2.24	2.47	1.89	2.08	0.89	0.93	0.54	0.6
Cd	1.29	1.27	0.33	0.36	0.37	0.4	3.77	3.79	0.81	0.88
Ni	0.86	0.83	0.22	0.2	0.21	0.22	1.27	1.25	0.78	0.81
Zn	11.56	11.42	90.25	93.53	122.41	126	28.81	28.86	10.18	10.88
Pb	1.51	1.44	4.31	4.27	4.13	4.05	7.72	7.49	0.61	0.63
Mo	0.38	0.35	11.24	11.2	5.87	5.96	2.94	2.88	0.23	0.22
Mn	4.12	4.04	2.8	2.82	3.26	3.33	5.76	5.75	4.06	4.32

Note: *Sample 1A and 1B is from Native soil. Remaining samples are from dump area*

10.1.3 COST ESTIMATION

To monetize the impacts, the assignment of the cost is determined by control cost methodology as provided in Extern E (2005) is adopted. The pollutants released in to the media are assigned the cost of per pollutant damage. To assign the cost of per pollutant damage, Benefits (or costs) transfer valuation method is employed (OECD, 1995). The environmental pricing values as specified in Bruyn et al. (2018) are used for each metal in soil.

To determine, whether the slag dump area is contaminated or not, the elements from the slag dump area is compared with native soil. To be on safer side, the minimum of two values of native soil is considered as representative of native soil. For determining the concentration in slag dump area, among the 9 sampling locations (18 analysis results), the maximum value for each element is chosen for comparison and cost estimation.

An area of 7061 m^2 with a depth of 1.0 m is considered to be cleaned and therefore volume of soil to be removed is 7061 m^3. The density of soil is considered as 1602.80 kg/m^3. This brings total weight of soil as 11317370.80 Kg. Total metal in the soil to be cleaned is estimated in Kg. The environmental cost for each element in Euro per Kg of that metal is determined from Dutch reference. There are three values prescribed for each element. Lower value, central value and upper value costs. In order to account for variation in concentration in an area of 7061 m2, the central value is considered for cost estimation. The Euro values are converted to Indian Rupees, followed by total cost for each metal for the year 2015 as the estimated were prepared for 2015 by CE Delft (Environment Price Hand Book 2017). Considering an inflation of 2.7 from 2015 to 2022 in India, the cost is adjusted for the inflation and is calculated for 2022.

The damage costs due to each pollutant are calculated and the costs are assigned to the average of all the locations and projected to entire dumping area and the same is given in table below:

Table: *Environmental Cost due to soil damage.*

Element	Native Soil (mg/kg)	Dump area (mg/kg)	Metal in Soil (kg)	Env. Cost (Euro per kg)	Env. Cost (Rs. per kg)	Cost (Rs.) in 2015	Cost (Rs.) in 2022
Cu	9.86	470.24	5321.88	0.239	19.12	101754	274737
Cr	0.62	2.47	27.95	0.000636	0.05088	1	4
Cd	0.03	4.19	47.42	2040	163200	7738909	20895053
Ni	0.47	1.3	14.71	0.342	27.36	403	1087
Zn	1.73	125.82	1423.95	8.78	702.4	1000184	2700496
Pb	0.26	7.72	87.37	14.2	1136	99252	267982
Mo	0.04	11.24	127.21	22.7	1816	231008	623723
Mn	5.32	7.01	79.33	0.946	75.68	6004	16211
						Total	**24779292**

Based on this methodology, the total environment damage cost comes out to be **Rs.2,47,79,292.00** (Rupees Two Crores Forty Seven Lakhs Seventy Nine Thousand and Two Hundred and Ninety Two only).

The detailed report on the damage cost assessment due to soil pollution caused on account of copper slag dumping by the unit along with the analysis results of the soil samples prepared by NEERI is placed as **Annexure-11**.

The following assumptions and/or estimates are considered for the damage cost estimation.

1. The dumping volume is estimated using Google Earth Imagery. The area of the dumping ground is estimated to be 7061 m^2. The depth of the dump is considered to be 1 meter.
2. 1 m^3 of soil weighs about 1602.8 Kg (WikiAnswers: http://wiki.answers.com/Q/ How_ much_does ... oil_weight).
3. The environmental pricing for pollutants is available for Netherlands. The appropriate exchange rates and inflation rates (https://data.worldbank.org/indicator/FP.CPI. TOTL. ZG? locations=CN-AE) are used to adjust the benefit transfer method.
4. As mentioned earlier, the impacts are identified based on the violation of the standard limit of soil quality parameters and by comparing with the metals in the native soil. If any of the violations either comparing with the Dutch standards or with the values observed for native soil are observed, they are considered as the impacts due to the plant operations and dumping.
5. The presence of metals in the soil of the dumping ground may in-filtrate in to the ground water or the surface water may also get contaminated. The rainwater may cause leachate discharge in the area and water bodies may get contaminated.
6. The leachate may discharge into surface and ground water. It was however observed that surface and ground water damage cost was almost negligible and therefore not considered in the study.
7. Higher loading of metals may impose the sever threat to environment and may reside for longer duration and therefore environmental externalities are computed.

10.1.4 REFERENCES FOR DAMAGE COST ASSESSMENT

- ExternE (1995). Externalities of Energy – METHODOLOGY. Prepared by Etsu, UK, and Metroeconomica, UK. EUR 16521 El. Published by the EUROPEAN COMMISSION Directorate-General XII Science, Research and Development, L - 2920 Luxembourg.
- ExternE (2005). Externalities of Energy Methodology 2005 Update. Edited by Peter Bickel and Rainer Friedrich Institut für Energiewirtschaft und Rationelle Energieanwendung — IER Universität Stuttgart, Germany.
- Bruyn, S., Ahdour, S., Bijleveld, M., Graaff, L.De, Schep, E., Schroten, A., Vergeer, R. (2018). Environmental Prices Handbook (2017). Methods and numbers for valuation of environmental impacts. Delft, CE Delft. Publication code: 18.7N54.057.
- European Commission (2000), DG Environment. A Study on the Economic Valuation of Environmental Externalities from Landfill Disposal and Incineration of Waste. Final Main Report. October 2000.
- OECD (1995). OECD Environment Directorate Environment Policy Committee (April 1995): Environmental Project and Policy Appraisal: A Manual for Policy Analysts.

10.2 DAMAGE COST ASSESSMENT DUE TO AIR POLLUTION, WATER POLLUTION AND OTHER NON-COMPLIANCES BY THE INDUSTRY (OTHER THAN SOIL POLLUTION CAUSED ON ACCOUNT OF DUMPING OF COPPER SLAG)

The damage cost assessment due to pollution caused by air, water and other non-compliance by the industry other than soil pollution (caused due to the dumping of copper slag) was carried out in compliance of order of Hon'ble NGT order and given in details in subsequent sections.

10.2.1 METHODOLOGY

CPCB deliberated for developing a formula for imposing environmental compensation on industrial units for violation of directions issued by regulatory bodies based on "Polluter Pay Principle".

CPCB statement in its Guidelines document on damage cost assessment due to environment degradation by the industrial activity states that; the environmental compensation need to computed using the equation (1) in the instances:

Discharges in violation of consent conditions, mainly prescribed standards / consent limits.
Not complying with the directions issued, such as direction for closure due to non-installation of OCEMS, non-adherence to the action plans submitted etc.
Intentional avoidance of data submission or data manipulation by tampering the Online Continuous Emission / Effluent Monitoring systems."

$$EC = PI \times N \times R \times S \times LF \qquad \text{- - - - - (1)}$$

Where,

EC is Environmental Compensation in ₹
PI = Pollution Index of industrial sector
N = Number of days of violation took place
R = A factor in Rupees (₹) for EC
S = Factor for scale of operation
LF = Location factor

The formula incorporates the anticipated severity of environmental pollution in terms of Pollution Index, duration of violation in terms of number of days, scale of operation in terms of micro & small/medium/large industry and location in terms of proximity to the large habitations.

Pollution Index (PI) is based on the CPCB guidelines on Revised Classification of Industrial Sectors under Red, Orange, Green and White Categories (2016). It is derived as a function of emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources.

For each component e.g. for air pollution, emissions are taken into account for the parameters namely PM, CO, NOx, SOx, Heavy Metals , Benzene, Ammonia and other toxic parameters relevant to the industry.

For water pollution, effluent discharge in terms of the parameters namely pH, TSS, NH3-N, BOD, Phenol and other toxic pollutants relevant to the industry are considered to compute the score.

For hazardous wastes (land fillable, incinerable, recyclable) as generated by the industry is considered.

This suggests that all the components relevant to the industry are considered in the DCA method based on pollution index. The method is inclusive of the chemical contamination in various media.

10.2.2 COST ESTIMATION

Pollution Index (PI) is a number in the range of 0 to 100 and increasing value of PI denotes the increasing degree of pollution hazard from the industrial sector. For the large scale industries, it is proposed to use PI as =80 as envisaged in the CPCB guidelines.

R is a factor in Rupees which is suggested as ₹250.

To select S i.e. the scale of operation, S=1.5 is considered to represent the large scale of the industry.

LF i.e. location factor depends on the location of the industry and population of the city. For the industrial unit located >10 km area from municipal boundary of the town, LF=1 is considered as specified in the CPCB guidance document.

N, number of days for which violation took place is the period between the day of violation observed and the day of compliance verified by GPCB. As per the data provided by GPCB on

the violations observed through inspection and complaints raised by the residents and NGOs, the number of violations are considered from the data of issue till the date of compliance or till the effective date of closure of the unit.

The violations of the industry observed by GPCB and the date of action taken/ compliance of the violations for the period from November 2016 till November 2021 are considered for calculation of N (Number of days). The details of the same is given in **Annexure-12** for reference. The abstract from the details containing the violations observed date and the compliance date and the calculation for the number of days for which violation took place (N) are summarized and given in table below for ready reference.

Table: *Calculation for number of days of violations*

Violations observed on date as per the record of GPCB	Compliance Date	No. of days of non-compliance
08/11/2016	11/11/2016	4
07/02/2017	10/02/2017	4
11/02/2017	17/07/2017	157
18/02/2017	22/02/2017	5
27/02/2017	02/03/2017	4
01/04/2017	12/05/2017	42
13/06/2018	29/09/2018	82
30/07/2019	31/08/2019	32
10/08/2019	31/08/2019	22
19/09/2019	24/01/2020	128
09/10/2019	24/01/2020	108
08/11/2019	03/02/2020	88
24/06/2020	05/10/2020	104
18/02/2021	20/03/2021	31
18/03/2021	04/09/2021	-- *
19/03/2021	04/09/2021	170
05/08/2021	04/09/2021	31
08/11/2021	16/11/2021	8
	Total number of days	**1020**

** The damage cost assessment for the soil pollution caused due to the dumping of copper slag by the industry in the forest area is calculated separately and given in section 10.1 above and hence not considered in this section to avoid duplication of the cost assessment.*

From the above calculation, Number of days of violation (N) =1020 days is considered for the present case.

Considering the above values and using the equation EC = PI x N x R x S x LF, the EC is calculated as below:

EC = 80 x 1020 x 250 x 1.5 x 1 = 3.060 Crore

Environmental Compensation is therefore calculated to be **Rs. 3,06,00,000** (Rupees Three Crores and Six Lakhs only)**.**

10.2.3 REFERENCES FOR DAMAGE COST ASSESSMENT

- CPCB. Final Document on Revised Classification of Industrial Sectors Under Red, Orange, Green and White Categories. February 29, 2016.
- Report of the CPCB In-house Committee on Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund, 2019.

Therefore, the total Environmental damage cost due to pollution caused by industry considering the soil pollution caused due to the dumping of copper slag in the forest area and considering air & water pollution and other non-compliances by the industry are calculated in sections 10.1 & 10.2 respectively, which amounts to a total cost of **Rs.5,53,79,292.00** (i.e. damage cost of Rs.2,47,79,292.00 assessed for soil pollution due to dumping of copper slag + the damage cost of Rs.3,06,00,000.00 assessed for pollution caused by air, water and other non-compliance by the industry)

11.0 REMEDIATION AND RESTORATION PLAN

The area of about 7061 m^2 in the forest area has been identified as the area affected due to copper slag dumping. Considering the said area of 7061m^2 area and with a depth of 1.0 m is considered to be cleaned and therefore volume of soil to be removed is 7061 m^3. Considering the density of soil as 1602.80 kg/m^3, the total weight of soil to be removed is about 11317.3708MT.

Therefore, about 7061m^3 of soil (about 11317.38 MT) from the said area should be removed

and disposed by the unit in accordance to the provision in the Hazardous and Other wastes (Management and Transboundary Movement) Rules, 2016 after obtaining prior permission from the local Forest Department under intimation to GPCB. Also, equivalent volume of fresh soil to suit the local condition to be refilled in the excavated area by the unit.

12.0 CONCLUSION

- The damage cost assessment was carried out by NEERI for the compliance of order of Hon'ble NGT due to soil pollution caused on account of dumping of copper slag by the industry is calculated as Rs.2,47,79,292.00 (Rupees Two Crores Forty Seven Lakhs Seventy Nine Thousand and Two Hundred and Ninety Two only).
- The damage cost assessment due to pollution caused by air, water and other non-compliance by the industry other than soil pollution (caused due to the dumping of copper slag) was carried out in compliance of order of Hon'ble NGT based on CPCB guidelines. The Environmental Compensation for the damage is calculated to be **Rs.** 3,06,00,000 (Rupees Three Crores and Six Lakhs only)**.**
- Therefore, the committee opined that the total Environmental damage cost due to pollution caused by industry considering the soil pollution caused due to the dumping of copper slag in the forest area (assessed in section 10.1 of this report) and considering air & water pollution and other non-compliances by the industry (assessed in section 10.2 of this report) amounts to a total cost of **Rs.5,53,79,292.00** (i.e. damage cost of Rs.2,47,79,292.00 + the damage cost of Rs.3,06,00,000.00) should be paid by the industry.
- The Remediation and Restoration plan in the forest area as per the recommendation of the committee mentioned in section 11.0 of this report be implemented on priority.
- The local Forest Department should be directed to permit the industry to implement the above Remediation and Restoration plan in the forest area recommended by the committee.

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Item No. 01 (Pune Bench)

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 70/2021(WZ)

Brackish Water Research Centre
Through its President Applicant

Versus

Gujarat State Pollution Control
Board Through its Member Secy., & Ors. Respondent(s)

Date of hearing: 05.01.2022

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Applicant: Ms. Shilpa Chohan, Advocate

Respondent: Mr. Maulik Nanavati, Advocate for the State of Gujarat & GSPCB
Mr. Aniruddha Kulkarni, Advocate for CPCB
Mr. Rahul Garg, Advocate for MoEF & CC
Mr. C.S. Vaidyanathan, Senior Advocate with Mr. Kaustubh Mishra, Advocate for Hindalco Industries Ltd.

ORDER

1. Grievance in this application is against continued violation of Birla Copper Plant being operated by Respondent No. 8, Hindalco, at Villages Lakhigam and Dahej, Tehsil Vagra, P.O. Dahej, District Bharuch, Gujarat and failure of the statutory regulators to remedy the situation by preventing the continuing violations and fixing accountability for the past violations.

2. Violations alleged have been summed up in the synopsis in the application as follows:

"The operation of Birla Copper Unit has resulted in ***Air, Water (surface and groundwater), Land, and Noise Pollution in and around the surrounding villages including the coastal area of Narmada Estuary and Gulf of Khambat (Arabian Sea), destruction of mangroves in CRZ-1A area and resulted in the destruction of forest land of Dahej Reserve Forest that adjoins the boundary of the Birla Copper plant as evidenced in the orders passed by R-4/Dy. Conservator of Forests. The inspection reports of R-l/GPCB for the years 2018-2021, Directions issued by R1/GPCB and R-6/CPCB, analysis reports of R-l/GPCB shows continued violations and non-compliance of the conditions of Consolidated Consent Authorisation (CCA) and environmental clearance granted to R-8/Hindalco to operate the Birla Copper unit at Dahej, Bharuch, Gujarat which resulted in issuance of closure orders dated 24.05.2017, 26.07.2018, 31.08.2019.*** *Some of the violations highlighted by the applicant and evidenced from the inspections reports of R-l/GPCB and R-6/CPCB relate to* ***dumping of copper slag in Dahej reserved Forest, leachate wastewater accumulation in Dahej reserved forest, heavy fugitive emissions in duct line of Smelter plant 3 due to leakages in duct line, ESP attached to Smelter Plant-3 non-operational, seepage of acidic greenish coloured in SAP-1 plant and its accumulation in Kaccha drain/storm water drain, parameters of PM and SO2 not reflected in OCEMS of stacks of Smelter Plant-3, indiscriminate dumping of Phosphogypsum and copper slag in and around the unit, dumping of heavy metals bearing toxic hazardous waste without encapsulation in captive TSDF site and in open, untreated water from Copper Slag storage area flowing into CRZ-1A area, persistent fugitive emissions at the plant, dumping of Arsenic baring sludge in captive TSDF site without encapsulation, non-provision of leachate collection system for captive TSDF SLF Cell No.7, groundwater contamination, leachate water from captive TSDF site travelling out of the unit premises into the Gulf of Khambat, release of Sulphur oxides(SOx) and Sulphur dioxide (SO2) from the manufacture of Sulphuric acid from the Sulphuric acid plant (SAP) due to inefficient scrubbing system and improper functioning of APCM (air pollution control monitoring devices) causing eye irritation amongst the residents of the nearby villages, Sulphuric acid parameters of 25 mg/ Nm3 (normal cubic meter) not being met on account of non-functional acid mist eliminator, high Hydrogen fluoride (HF) emissions from Phosphoric Plant*** *etc.*

The present OA raises substantial question relating to environment, as the continued operation of Birla Copper unit has resulted Air, Water (surface and groundwater), Land and Noise Pollution in and around the surrounding villages including the coastal area of Narmada Estuary and Gulf of Khambat(Arabian Sea) which is having deleterious effect upon the health of the residents of Village Lakhigam and Dahej and the environment and there is an immediate need to restitute the environment including preparing and formulating a restitution and restoration plan of the forestland of Dahej Reserve Forest"

3. Averments in the application briefly are that the industrial unit was established in the year 1995 and is a large scale 'red' category unit in Dahej Industrial Estate. Environmental Clearance (EC) was granted in the year 2002. The unit was expanded in the year 2005 by diversion of forest land in Dahej forest reserve area for which EC was granted on 11.02.2009. Further diversion of forest area was allowed in the year 2013. CC&A was granted by Gujarat State PCB in 2014, amending the earlier consent. The unit, being in the category of highly polluting industries, was required to install and operate online source emission and effluent monitoring systems. On account of violations, CPCB directed closure on 26.07.2016 which was later revoked. In 2017, further expansion of the unit was granted. There was a further closure order on 24.05.2017 by CPCB which was also later revoked. However, the violations have continued. On 13.06.2018, after inspection by the GPCB, several violations were found as follows:

> "• *It is also observed that unit has connected another pipeline to RO reject discharge line from first stage treated w/w holding lagoon (which is bypass line bypassing the second state treatment ETP) and can be discharged directly from the first stage treated w/w holding lagoon without polishing treatment.*
>
> • *Ponding of water/wastewater is observed at back side of ETP lagoon outside the premises. Soil near ponding looks yellowish and black colored.*
>
> • *Unit is using water for dust suppression in copper slag storage heaps, near smelter no.3 which leachate is spreading go nearby open area outside the premises resulting in huge ponding of waste water outside premises near this location.*
>
> • *Due to leakages from the top of caustic scrubber1 strong SO2 is felt in this area.*
>
> • *Strong SO2 smell is felt near Sulphuric Acid Plant1.*
>
> • *Heavy dusting is observed from the conveyor belt for the conveyance of powder material.*

- *Unit has not provided wet scrubber or any other APCMs in coal handling area.*

- *Heavy dusting is observed from the huge quantity of fly ash dumped on open land opposite CPP-2/3 and spreading in the ambient air.*

- *During inspection, huge quantity of Phosphogypsum is found stored in the Phosphogypsum storage yard within the premises which is open to sky. Storage of Phosphogypsum sludge is observed not in environment friendly manner.*

- *It is informed by the contacted person of the industry that Arsenic bearing sludge generated from the Refinery plant is recycled several times and after saturation, it is disposed into own SLF. Record regarding disposal of Arsenic bearing sludge is not found with the unit. Also, any record of encapsulation of Arsenic bearing sludge or any other waste is not found with the unit.*

- *During inspection, these leachate collection wells are found completely filled up and there is overflowing of leachate into open drains."*

4. Further violations were found on inspection of captive TSDF conducted on 14.08.2018. GPCB issued directions on 29.08.2018 for remedying the violations. Still further inspection was conducted by GPCB on 10.08.2019 on account of death of a worker due to collapse of conveyer belt on account of acidic leakage in the plant. Highlighting the violations found, order under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 was issued on 31.08.2019 by the GPCB. On 24.01.2020, show cause notice was issued due to heavy fugitive emissions from PAP, acidic fumes being emitted through leakages in PAP digestors and reactor (no 1813), severe eye irritation in PAP area, acidic water being accumulated in storm water drain line of PAP plant area, SLF No 2,6,7 were damaged due to soil erosion.

5. Notice dated 02.02.2020 was also issued by GPCB for improper handling and storage of Phospho-gypsum from the Birla Copper unit to the Bharuch Railway Yard resulting in dusting/fugitive emission. Though CC&A granted by GPCB is subject to conditions for scientific handling of

hazardous waste, waste water, setting up of online monitoring systems, handling of leachate, TSDF and SLF cells, the said conditions have been rampantly violated as found in inspections conducted by GPCB on 18.03.2021, 19.03.2021 and 20.03.2021 as follows:

> *"• Continuous seepage of acidic greenish coloured waste water is observed in SAP-1 area.*
>
> *• During inspection, heavy stack emission of SO_2 gas and particulate matter is observed being emitted through stack attached to centralized scrubbing system of smelter plant-3, provided ESP are found notworking.*
>
> *• Heavy fugitive emission of SO_2 gas is also observed through leakages at various location of duct line of smelter plant 3, eye and nose irritation is felt due to heavy SO_2 gas emission*
>
> *• Actual parameters like PM and SO_2 are not reflected in OCEMS of stacks.*
>
> *• During visit, copper slag and Construction and Demolition waste is observed dumped in open land area (16 ha area) located north of smelter pplant-3. Leachate generated due to dumped copper slag is observed being accumulated in three small wastewater ponding.*
>
> *• Dumping of copper slag in reserved forest.*
>
> *• Leachate wastewater is observed being accumulated in Reserved Forest."*

6. However, no adequate remedial action has been taken for preventing the violations and for holding the violators accountable for the past violations.

7. The applicant has impleaded the Project Proponent (PP) – Hindalco Industries Ltd., MoEF&CC, CPCB, GCZMA, Forest Department and GPCB and filed the documents of ECs, inspections and notices issued by GPCB and CPCB which have been briefly mentioned earlier.

8. On 27.10.2021, the Tribunal admitted the application and issued notice. Replies have been filed by the PP as well as GPCB and CPCB. On

18.11.2021, the Tribunal noted the filing of pleadings by the parties and adjourned the matter to enable the applicant to file rejoinder affidavit. The applicant has accordingly filed rejoinder affidavit.

9. We may now briefly refer to the pleadings filed by the opposite parties and the rejoinder filed thereto by the applicant.

10. Stand of the PP is that all violations have since been remedied, except removing slag dumped in the reserved forest which could not be removed for want of permission of the Forest Department. The PP has paid penal compensatory afforestation amount of ₹94,20,000/- for diversion of forest land and ₹17,84,000/- for damage to the land of the Forest Department. Copper slag is being duly stored/disposed of. Liquid effluent is being duly treated. Reverse osmosis is being used for treatment. Gypsum yard and Coal yard are being duly maintained. Response and remedial action against the violations found have been given in tabular form as follows:

"

Sl. No.	***Regulatory Action taken by Respondent No.1***	***Responses and remedial action taken by Respondent No. 8***
1.	*Inspection Report dated 13.06.2018 was issued by Respondent No. 1 with 11 observations.*	*As detailed in the 1st Reply dated 11.07.2018 and 2nd Reply dated 22.05.2019, all the observations flagged in the inspection Report dated 13.06.2018 stand closed as on 22.05.2019 and supporting documentation was furnished to the Respondent No. 1 regarding remedial measures undertaken. Copy of the Respondent No. 8's reply dated 11.07.2018 are annexed hereto* ***ANNEXURE 88/16.***
2.	*Inspection Report dated 14.08.2018 issued by Respondent No. 1 with 1 observation*	*As stated in the Reply dated 25.08.2018, the observation was immediately addressed and closed and supporting documentation was furnished to the Respondent No. 1 regarding remedial measures undertaken. Copy of the Respondent No. 8's reply dated 25.08.2018 is annexed hereto* ***ANNEXURE R8/17.***

3.	*Inspection Report dated 10.08.2019 issued by Respondent No. 1 with 3 observations*	*As detailed in the I' Reply dated 12.08.2019, 2"d Reply dated 03.09.2019, all the three observations were addressed and closed and supporting documentation was furnished to the Respondent No. 1 regarding remedial measures undertaken. Copy the Respondent No. 8's reply dated 12.08.2019, 03.09.2019 are annexed hereto* ***ANNEXURE R8/18.***
4.	*To show cause Notices dated 24.01.2020 were issued by Respondent No.1 based on inspection conducted on 19.09.2019 and 09.10.2019 and 06.02.2020*	*Detailed responses were furnished on 23.09.2019, 11.10.2019, 18.11.2019, 06.02.2020 and observations were addressed. Supporting documentation regarding action taken was furnished to Respondent No. 1. Copies of Show Cause Notice dated 24.01.2020 and replies dated 23.09.2019, 11.10.2019, 18.11.2019 are annexed hereto as* ***ANNEXURE R8/19.***
5.	*Notice of Direction dated 02.02.2020 was issued by Respondent No. 1 in relation to disposal of phosphogypsum*	*Detailed response was furnished on 06.02.2020 addressing the observations and supporting documentation was furnished to Respondent No. 1. Copy of Notice of Direction dated 02.02.2020 and response dated 06.02.2020 is annexed hereto as* ***ANNEXURE R8/20.***
6.	*Inspection Reports dated 18-20.03.2021 were issued by Respondent No. I with 7 observations*	*Detailed responses were furnished on 31.03.2021, 24.05.2021, 05.08.2021, 17.09.2021. Copies of Inspection Reports dated 18-20.03.2021 and replies dated 31.03.2021, 24.05.2021, 05.08.2021 and 17.09.2021 are annexed hereto as* ***ANNEXURE R8/21.***

”

11. GPCB has filed a copy of notice dated 16.11.2021 proposing closure of the industrial unit for violations which are listed as follows:

> *“1) Copper slag is observed being dumped in about 10-meter width area of Reserved Forest along the boundary wall of factory premises (outside the factory premises) behind the 16, hectare land area*
> *2) Unit has not lifted previously dumped copper slag from Reserved Forest area*
> *3) Ponding of storm water/contaminated storm water is observed in Reserved Forest area behind the 16- hectare land area of the unit. Analysis Report (AR) of sample collected f.om contaminated water/water ponding in the reserved forest area shows pH: 6.33, COD:59 mg/l, NH3-N:6.16 mg/l, Copper:3.71 mg/l.*
> *4) Analysis Report (AR) of Ambient sampling point: AAQM carried out at 16 acre area [behind the Smelter-3, common stack) shows RSPM: 442 mg/m^3 which is high.*

5) Analysis report (AR) of Samples collected from stacks shows unit i; not complying emission norms prescribed in CCA as below:

Sample Location	***Parameters Observed***	***Norms***
Stack attached to secondary gas scrubber of Smelter-1, Plant	*SO_2: 124.08 mg/nm^3*	*SO_2: 40mg/nm^3*
Stack attached to centralized scrubbing system of smelter-III	*SO_2: 43.54 mg/nm^3*	*SO_2: 40 mg/nm^3*
Stack attached to Sulphuric acid plant -1	*ACID MIST: 30 mg/nm^3*	*ACID MIST: 25 mg/nm^3*

6) Unit has not provided adequate Green belt and plantation area."

12. The stand of the CPCB is that closure notice dated 24.05.2017 for incomplete installation and connectivity of OCEMS was issued which was revoked on 14.06.2017. Earlier, closure direction dated 26.07.2016 for non-compliance of OCEMS was issued which was revoked on 15.11.2016. Rest of the issues have been left to be dealt with by the State PCB and the MoEF&CC.

13. The applicant in his rejoinder affidavit has reiterated that over a period of time there is non-compliance of EC conditions and CCA. Some of the violations highlighted by the applicant and evidenced from the inspections reports of R-I/GPCB and R-6/CPCB relate to dumping of copper slag in Dahej reserved forest, leachate wastewater accumulation in Dahej reserved forest, heavy fugitive emissions in duct line of Smelter plant 3 due to leakages in duct line, ESP attached to Smelter Plant-3 non-operational, seepage of acidic greenish coloured water in SAP-1 plant and its accumulation in GO Kaccha drain/storm water drain, parameters of

PM and SO_2 not reflected in OCEMS of stacks of Smelter Plant-3, indiscriminate dumping of Phosphogypsum and copper slag in and around the unit, dumping of heavy metals bearing toxic hazardous waste without encapsulation in captive TSDF site and in open, untreated water from Copper Slag storage area flowing into CRZ-1A area, persistent fugitive emissions at the plant, dumping of Arsenic baring sludge in captive TSDF site without encapsulation, non-provision of leachate collection system for captive TSDF SLF Cell No.7, groundwater contamination, leachate water from captive TSDF site travelling out of the unit premises into the Gulf of Khambat, release of Sulphur oxides (SOx) and Sulphur dioxide ($S0_2$) from the manufacture of Sulphuric acid from the Sulphuric acid plant (SAP) due to inefficient scrubbing system and improper functioning of APCM (air pollution control monitoring devices) causing eye irritation amongst the residents of the nearby villages, Sulphuric acid parameters of 25 mg/ Nm^3 (normal cubic meter) not being met on account of non-functional acid mist eliminator, high Hydrogen fluoride (HF) emissions from Phosphoric Plant etc. At different point in time R-1/GPCB, has conducted inspection and flagged the violations and can be seen from a series of Inspection reports from 2018 onwards until 2021, that violations have continued. Additionally, R-1/GPCB has not undertaken steps to stop the continued violations. The undertaking of certain piecemeal measures does not absolve R-8 DA -09-202 of the violations of the past and its effect upon the environment, of which has neither been assessed by R-1/GPCB. The R-1/GPCB has been a mute spectator to the continued violations by R-8. The averment of answering respondent as to the shutdown of DAP and PAP plant being voluntary is a hogwash, as it is outcome of the various inspection reports of R-1/GPCB and notice of Direction issued by R-1/GPCB. As per averments made in the present reply and reply given to

R-1/GPCB pursuant to the inspections conducted, the closure is temporary. It is vehemently denied that the applicant has averred that the PAP and DAP plant are operational, the factum of their closure is mentioned in Inspection report (IR) dated 13/02/2020. The inspection report of March 2021, also mentions that DAP and PAP Plant is closed, so applicant is only relying upon the documents of the R-1/GPCB. In the IR dated 13.02.2020, it is mentioned that DAP and PAP plants are not operation but "in PAP plant reactor 3 acidic fumes are observed liberating from the top of the reactor and heavy dusting of rock phosphate". After the temporary closure of DAP and PAP plant, there was a complaint made by Lakhigram Gram Panchavat of air, water, noise pollution on account of copper smelter plant. The DAP and PAP plant are major contributors to the air pollution in the area, though air pollution continued unabatedly and the same is evident from notice of direction dated 06.11.2021 issue by R-1/GPCB, pursuant to the inspection conducted. The factum of DAP and PAP plant not being operational has no bearing on issue of disposal of phosphogypsum which has been dumped discriminately in the plant area and the same is evidenced from the observations of R-1/GPCB. The dumping of copper slag is not a "historical issue'", as it continues unabated and the same is evident from IR of R-1/GPCB, representation of applicant made in 2021 showing pictures of copper slag dumped in creek area, CRZ IA area near the plant. The averment of R-8 that copper slag is a "historical issue" (though not admitting) is an acceptance of its dumping and its impact on the environment and coastal area has to be assessed. The picture of SLF shown is misleading as this is just one of SLF cells, there are 8 in numbers. The question is of dumping of Hazardous waste in SLF for which CTE has not been obtained and the same is evident from the inspection report of R1/GPCB. The applicant has not "cherry picked and

highlighted certain observations from inspection reports", these are the averments made by regulatory authority i.e. R-1/GPCB. In the Inspection reports of R-1/GPCB, the reply of R-8, is also mentioned and against that whether there is compliance or noncompliance of directions is made by R-1/GPCB, so where is the question of cherry picking observations.

14. It has been further stated that the PP on its own showing exceeding the permitted quantity of spent acid being hazardous as per CCA (2020) which is illegally disposing off the additional quantities of Sulphuric Acid in the coastal areas around the Plant. It has not mentioned Sulphuric acid generation and its legitimate use by other industry as spent Sulphuric acid being categorized as hazardous waste requires prior permission from R-1/GPCB for sale and also its transportation in the form of manifest. The dumping of copper slag is taking place in the CRZ areas as per the pictures which were sent to regulatory authority which conducted inspection but did not inspect the CRZ areas. There is no approved plan for storage, handing and disposal of copper slag leading to its detrimental impact on environment especially reserved forest and CRZ areas. The photographs of the mangroves shown by R-8, are actually Prosophis julifera called Gando Bawal which is an invasive species and a problem in Coastal areas. R-8 has dumped slag over the coastal areas having mangroves areas

15. We have heard learned Counsel for the parties and perused the record.

16. Learned Counsel for the applicant, apart from drawing our attention to the notice issued by GPCB on 16.11.2021, has referred to its representation dated 17.02.2021 pointing out various violations, including the water pollution (surface and ground water) as per reports of the labs from 2019 to 2021, air pollution, damage to the forest including

mangroves, violation of leachate management norms, violation of hazardous waste norms and violation of consent conditions and CRZ regulations.

17. Learned Counsel for the GPCB fairly acknowledged that there have been violations in the past for which no adequate action was taken but GPCB now proposes to take stringent action for the past violations as well as for ensuring compliance of the environmental norms.

18. Learned Counsel for the PP submitted that as on today all norms have been complied and will continue to be complied, except removing the slag from the reserved forest which is held up for want of permission of the Forest Department.

19. We have given due consideration to the matter. Though the PP claims to have remedied the violations, except for removing the slag from reserved forest, it is necessary to have independent verification of such claim in view of stand of the applicant and the GPCB to the contrary. It is difficult to accept justification for not removing slag from reserved forest. Having illegally dumped such waste in forest, convenient plea that forest is not permitting clearance to continue such violations is untenable. It is not shown what remedies, if any, were taken for denial of such permission so as to ensure compliance with law and to remedy the blatant illegality committed by the PP. There is no justification for failure of the statutory regulators in taking action under polluter pays principle or otherwise against violations. Even if there is now compliance, as claimed by the PP, accountability needs to be fixed for the past violations in the matter of leachate management, slag management, TSDF management, air, water (surface and ground) and soil pollution, damage to the forest and

mangroves and compliance of the consent and EC conditions, after verification of facts for five years prior to filing of the application i.e. 17.09.2021 and continuing violations, if still found. Apart from remediation and restoration plan, the compensation has to be assessed on principle of restoration with element of deterrence, having regard to the financial capacity of the PP in the light of law laid down inter-alia in *Sterlite Industries (India) Ltd. v. Union of India*, (2013) 4 SCC 575 and *Goel Ganga Developers India Pvt. Ltd. v UOI*, (2018) 18 SCC 257.

20. In the light of above, we consider it appropriate to constitute a seven-member joint Committee headed by Justice B.C. Patel, former Judge of Gujarat High Court and former Chief Justice of J&K and Delhi High Courts with representatives of MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF (HoFF) Gujarat and Gujarat Coastal Zone Management Authority as members. The CPCB and State PCB will be the nodal agency for coordination and compliance. Meeting of the Committee may be convened preferably within three weeks. The Committee or such of its members as may be decided by the Chairman may undertake visit to the site and interact with stakeholders. The Committee will be free to co-opt any other expert/institution for its assistance and conduct proceedings online, if necessary. The parties will be free to put forward their respective written version before the Committee through the GPCB within three weeks from today. The Committee may preferably give its report within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF. A copy of the report may also be uploaded on the website of GPCB for response of the parties, if any, before the next date.

List for further consideration on 27.04.2022.

A copy of this order be forwarded to Justice B.C. Patel, former Judge of Gujarat High Court and former Chief Justice of J&K and Delhi High Courts, MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF (HoFF) Gujarat and Gujarat Coastal Zone Management Authority by e-mail for compliance.

Adarsh Kumar Goel, CP

Dr. Nagin Nanda, EM

January 05, 2022
Original Application No. 70/2021(WZ)
DV

Annexure-2

Minutes of the Meeting held on 21st January 2022 at 11:30 hrs through video conference under the Chairmanship of Honourable Justice B.C.Patel as per the direction of Honourable National Green Tribunal vide order dated 05/01/2022.

Agenda	To implement direction of Honourable National Green Tribunal issued vide order dated 05/01/2022 in the matter of O.A. 70/2021
Reference	Hon'ble NGT order dated 05.01.2022 in the matter of O.A. No. 70/2021
Date and time	21st January 2022 at 11.30 Hrs
Venue	Committee Room, Gujarat Pollution Control Board, Sector 10A, Gandhingar.

Key Attendees:

1. Dr.V.K. Srivastav, Member, SEIAA, Gujarat
2. Shri C.K.Sonawane, IFS, Chief Conservator of Forest,Surat Circle
3. Shri Yogesh Kumar, Dy. Director, Scientist C, MOEF&CC
4. Shri S.Pradeep Raj, Scientist-D, CPCB.
5. Shri Nischal Joshi, Sr. Technical Officer,GCZMA, Gujarat
6. Shri F.M. Modi, Regional Officer, GPCB, Bharuch

At the outset, Honourable Chairman of the joint committee apprised the members of the committee regarding an interim order passed by the Honourable National Green Tribunal (NGT) in O.A.70/2021, Brackish Water Research Centre Versus Gujarat State Pollution Control Board issued on 05.01.2022.

Members of the committee were made aware that M/s. Hindalco Industries Limited is a large scale industrial unit under red category established in 1995. Various Closure directions were issued to the unit on dated 24.05.2017, 26.07.2018, 31.08.2019 which indicates unit has violated environmental norms grossly. Referring to various non-compliances of this unit, it was noted that nature of pollution is high.

Looking to the various non-compliances observed during inspection carried out from time to time, entire industrial unit is required to be thoroughly monitored, breaches/noncompliance for the last five years from 17.09.2021 are to be identified, records of raw material receipt, production and balance details thereof in terms of evaporation/accumulation/ disposal/thermal decomposition/ reuse etc are to be verified with subsequent damage to the environment and ground water contamination with deterrent factor of cost of environmental damage. Further, it was also felt to verify whether products manufactured by the unit and wastes generated are in consonance with the CCA issued by the GPCB or not.

Accordingly, a visit to the industrial unit was planned in order to assess aforementioned details.

It was also deliberated that why forest department has not permitted the industrial unit to take out the dumped solid waste (Copper Slag) lying in the reserve forest to which CCF mentioned that there is no details available with them as to where these dumped material would be shifted along with accumulation of contaminated water for its disposal in environment friendly manner with restoration of the soil to its pristine value.

Shri Sonawane,IFS informed the committee that about 8 offences have been registered against the industrial unit since 2004 and forest department has imposed penalty to the industrial unit.

Shri Nischal Joshi, Sr. Technical Officer, GCZMA mentioned that there is a continuous environmental damage due to dumping of Copper Slag and Contaminated Water accumulation in the reserve forest and it needs to be removed at the earliest to further prevent damage to the environment and ground water contamination.

Details of the products manufactured by the unit vide the order of CCA was deliberated and it was decided to send the details of copy of CCA along with details raw material consumed, products manufactures, waste generated and its handling and subsequent whereabouts is to be availed from the industrial unit so that same can be deliberated in upcoming meeting scheduled on 28th January 2022.

Dr.V.K.Srivastav, Member SEIAA mentioned that there is a need of verification of overall environment management plan of the industrial unit in terms of Air, Water and Haz.Waste aspects along with occupational health, safety measures taken by the industrial unit with respect to the toxic/hazardous compound handled by the unit. Further he mentioned that CER is also required to be verified which is to be spent by the unit as per the provision of the EIA Notification 2006. It is further mentioned that a study of at least one km area surrounding to the unit is required to assess ground water quality, soil condition and its contamination, level of porosity and permeability to assess as to what extent ground water table is under threat.

Dr. Yogesh Kumar, Dy. Director/Scientist 'C' MoEFCC, informed that the site inspection of the plant has recently been carried out wherein it was found that the condition of the smelter unit was in bad shape. The raw material handling area too was very poor. It was informed by the PP during the inspection that the contract has been given to L&T for renovation of the smelter unit. It was found that the copper slag was lying along the boundary of the reserve forest. The unit were constructing a drain around the adjoining boundary of reserve forest to prevent any gushing of water outside the plant premises. It has suggested that there a need to formulate a methodology along with parameters involved to access the damage caused to the environment since 2017. It has also suggested to prepare a Land Use Land Cover Change Map of the area concerned using high resolution data for forecasting the environmental damage.

Conclusion

Honourable Chairman of the committee concluded meeting with the following decision:

- To invite expert member of IIT, Gandhnagar and NEERI, Nagpur for further technical assistances to the committee
- To conduct next meeting on 1st February 2022 before carrying out inspection of industrial unit.
- To avail raw material consumed, product/by-product manufactured, mass/material balance data, waste generated & disposed for the period of last 5 years from17/09/2021 prior to inspection of unit

The meeting was concluded with vote of thanks to the Chair.

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Minutes of the Meeting held on 1st February 2022 at 11:00 hrs through video conference under the Chairmanship of Honourable Justice B.C.Patel as per the direction of Honourable National Green Tribunal vide order dated 05/01/2022.

Agenda	To implement direction of Honourable National Green Tribunal issued vide order dated 05/01/2022 in the matter of O.A. 70/2021
Reference	Hon'ble NGT order dated 05.01.2022 in the matter of O.A. No. 70/2021
Date and time	1st February 2022 at 11.00 Hrs

Key Attendees:

1. Dr.V.K. Srivastav, Member, SEIAA, Gujarat
2. Shri C.K.Sonawane, IFS, CCF,Surat Circle, Gujarat
3. Dr. Yogesh Kumar, Dy. Director, Scientist C, MOEF&CC.
4. Shri S.Pradeep Raj, Scientist-D, CPCB.
5. Dr. Chinmay Ghoroi,Asst. Professor, IIT,Gandhinagar
6. Dr.K.V.George, Sr.Principal Scientist & Head,NEERI,Nagpur
7. Shri Ashok Chauhan, JTO and Under Secretary, GCZMA, Gujarat
8. Shri F.M. Modi, Regional Officer, GPCB, Bharuch

At the outset, Honourable Chairman of the joint committee apprised the members of the committee regarding proceeding of the last meeting and also informed regarding the data submitted by the industrial unit which was circulated to the committee members.

Details of the industrial unit pertaining to last five years in respect of raw material consumption, production, gap, haz.waste generation were discussed at length and found some deviation with reference to the CCA accorded by the GPCB.

Dr.Yogesh Kumar, MoEFCC informed that a wide variation has been recorded in the amount of coal used by the unit. The prescribed limit as per CCA is 36980 MT whereas it was found that it goes up to 42786 MT. It has further reiterated that a land use land cover map should be prepared since 2002 to assess dumping of copper slag and its impact on the vegetation density and character of the forests. It was suggested to collect water sample around slag storage area to check any leachate of heavy metal from the slag. The data will give a glimpse about the HDPE lining of SFL area and will help in environment loss evaluation. It was directed by the committee members to provide the parameters required for LULC (Land Use Land Cover) mapping in consultation with forest department to GPCB for further work allocation to reputed remote sensing agency.

Dr. Chinmay Ghoroi, Asst. Professor, IIT,Gandhinagar mentioned that industrial unit is consuming coal on higher side of the consent which shows higher production may have been taken.

Shri S. Pradeep Raj, CPCB mentioned that the EC (Environmental Clearance) compliance status, CCA (Consolidated Consent and Authorization) compliance status, compliance status of the Directions issued by GPCB & Forest Department may be obtained from the industrial unit in a tabular form to compare and assess the same. It was also suggested to circulate the Form-5 of the industry submitted to GPCB in last 5 years

Shri C.K.Sonawane, IFS,CCF mentioned that in order to assess impact on reserve forest land in vicinity of the industrial unit including surrounding of the industrial unit, land use pattern map of affected site from BISAG or any prominent agency from 2002 till date shall be availed.It is further mentioned that first offence by the industrial unit was observed in the year 2004 and accordingly forest department has penalized the industrial unit. It was informed that 16 Ha land is acquired by the industrial unit and about 8 to 9 Ha is remaining which shows no growth of vegetation.

Shri Ashok Chauhan, JTO, GCZMA mentioned that while preparing land use map, it shall cover mangrove area also. Further, it was also mentioned to obtain details from Industry regarding any change in effluent quantity due expansion of production, if any and whether there is any change in effluent discharge mechanism in CRZ areas after first EC.

Dr. K.V. George, NEERI, Nagpur mentioned that the non-compliance be prepared in tabular form based on the CC&A document. All show cause notices issues should also be indicated in time series along with violations. Action taken by GPCB in this regard needs to be recorded. The tabular format should contain as per CCA, the quantity of raw material permitted and actual quantity used in the plant, hazardous waste generated so as to ascertain the non-compliance of the CCA.

Dr.V.K.Srivastav,SEIAA mentioned various aspects mentioned as below shall be considered (1) Verification of overall environment management plan of the industrial unit in terms of Air, Water and Hazards (2) Waste aspects along with occupational health, safety measures taken by the industrial unit (3) CER is required to be verified which is to be spent by the unit as per the provision of the EIA Notification 2006 (4) Study of at least one km area surrounding to the unit is required to assess ground water quality, soil condition and its contamination, level of porosity and permeability to assess as to what extent ground water table is under threat (5) Sludge Composition of the waste (6) Waste Water treatment and sludge (7) Disposal plan & sludge collection (8) Environment Clearance comparison 2009 vs 2017 (9) Year wise action taken report by various authorities (10) GIS report of forest including density of forest.

At the outset, to evaluate the Environment Damage Compensation (EDC), member of CPCB was requested to submit the details required to assess the same.

Conclusion

Honourable Chairman of the committee concluded meeting with the following decisions:

- GPCB will circulate last five year details of production, raw material consumption, inspection carried out and action taken in terms of show cause notices, notice of direction, Direction/Closures as per the non-compliances observed and aforementioned details as desired by the committee members.
- Land Use Land Cover(LULC) pattern map shall be availed from the BISAG.
- To meet again on 15th February 2022 at 11.00 through video conference.

The meeting was concluded with vote of thanks to the Chair.

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Minutes of the Meeting held on 15th February 2022 at 11:30 hrs through video conference under the Chairmanship of Honourable Justice B.C.Patel as per the direction of Honourable National Green Tribunal.

Agenda	To implement direction of Honourable National Green Tribunal issued vide order in the matter of O.A. 70/2021 dated 05/01/2022
Reference	Hon'ble NGT order in the matter of O.A. No. 70/2021 dated 05.01.2022
Date and time	15th February 2022 at 11.30 Hrs

Key Attendees:

1. Dr. Yogesh Kumar, Dy. Director & Scientist C, MOEF&CC.
2. Shri S.Pradeep Raj, Scientist-D, CPCB.
3. Shri Paresh Chaudhry, ACF, Gujarat
4. Dr. Chinmay Ghoroi,Asst. Professor, IIT, Gandhinagar
5. Dr.K.V.George, Sr.Principal Scientist, NEERI, Nagpur
6. Shri Ashok Chauhan, JTO and Under Secretary, GCZMA
7. Shri F.M. Modi, Regional Officer, GPCB, Bharuch

At the outset, honourable members of the committee were apprised of the details submitted by the GPCB as discussed during the meeting held on 01.02.2022.

Deliberation of the data submitted by the unit in Form V was discussed at length and it was noted that the data is bulky and its interpretation with regard to CCA of the unit may take time to arrive at any proper conclusion. Hence, the details submitted by the unit shall be made in excel sheet showing limits prescribed in the consent of the unit accorded by GPCB and details of raw materials consumed, production quantity, water consumption, wastewater generation, fuel consumed, hazardous Waste generation and its disposal as per CCA with names of authorized agencies with their permissions.

Dr.Chinmay Ghoroi mentioned that in case of understanding the data in context to CCA, audit report of the last five years along with compliance of recommendation may be sought from the industrial unit to assess the facts.

Dr.K.V.George recommended to prepare an excel sheet for the data submitted of raw materials, products, fuel consumed, hazardous waste generated in context to the quantity permitted in CCA and actually executed so as to assess the compliance. This will not only give glimpse of overall status but also give facts of the data based on noncompliance observed in past by various statutory agencies and action reported.

The detail pertaining to land use land cover (LDLC) was discussed and Dr. Yogesh Kumar mentioned that a APCCF(Land) has requested Director, BISAG, Gandhinagr to provide satellite imaginary of forest land, compartment No: 596 of village Dahej,Ta:vagra,Dist:Bharuch and will expedite the process to avail the same.

At the outset, Honorable Chairman of the committee enquired RO GPCB to share current compliance status of the industrial unit considering past observations to which it was decided that a joint team of MOEF&CC,CPCB and RO-GPCB will visit the industrial unit in a day or two and will submit a report to the committee within 8 to 10 days along with

analysis report of the samples collected to assess overall compliance status of the unit. Accordingly, Shri S. Pradeep Raj, CPCB opined that sampling of wastewater/ treated wastewater from the ETP/ wastewater treatment plants, any stagnant water in the storm water drain or in premises, piezometric well or any bore well in the premises shall be carried out, observation of stacks and OCEMS status shall be carried out and monitoring of few operational stacks on a random basis on field condition shall be carried out, sampling of soil shall also be carried out during the visit to the industry.

As suggested, the operational status of various units in the industry shall be verified and the compliance status of observations & recommendations made by GPCB during the previous visit shall also be verified during the visit. The status of the storage of hazardous & other waste shall also be verified and shall be reported along with photographs.

In line of above, as the details envisaged by the committee is submitted and availed to all the members, Hon'ble Chairman of the committee asked committee members to prepare questions referring to the details submitted by the unit and GPCB so as to carry out the inspection of the unit by the committee at the earliest.

Conclusion

Honourable Chairman of the committee concluded meeting with the following decisions:

- GPCB will circulate Audit report of last five years of the unit after availing from the industrial unit.
- To meet again on 14th March 2022 at 11.30 Hrs. through video conference.

The meeting was concluded with vote of thanks to the Chair.

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Minutes of the Meeting held on 14thMarch 2022 at 11:30 Hrs. through video conference under the Chairmanship of Honourable Justice B.C.Patel as per the direction of Honourable National Green Tribunal.

Agenda	:	To implement direction of Honourable National Green Tribunal issued vide order in the matter of O.A. 70/2021dated 05/01/2022
Reference	:	Hon'ble NGT order in the matter of O.A. No. 70/2021dated 05.01.2022
Date and time	:	14thMarch 2022 at 11.30 Hrs

Key Attendees:

1. Dr. V. K.Srivastav, Member, SEIAA
2. Dr. Yogesh Kumar, Dy. Director, Scientist C, MOEF&CC.
3. Shri S. Pradeep Raj, Scientist-D, CPCB.
4. Shri Kripalsinh Gohil, RFO, Bharuch, Gujarat
5. Dr. Chinmay Ghoroi, Asst. Professor, IIT, Gandhinagar
6. Dr. K.V. George, Sr. Principal Scientist & Head, NEERI, Nagpur
7. Shri Ashok Chauhan, JTO and Under Secretary, GCZMA, Gujarat
8. Shri F.M. Modi, Regional Officer, GPCB, Bharuch

At the outset, honourable members of the committee were apprised of the joint inspection carried out by CPCB and GPCB as decided in previous meeting.

Shri S. Pradeep Raj of CPCB made a presentation regarding the inspection and monitoring of M/S Hindalco Industries Limited, GIDC, Dahej carried out jointly by CPCB and GPCB on 18.02.2022 and 19.02.2022. He explained the methodology adopted during field visit with details of plant operation status, identification &finalization of sampling/ monitoring locations and various monitoring activities carried out during inspection, observations made with reference to violations mentioned in application filed before Hon'ble NGT in the said matter and other findings & observations made during the visit. The monitoring/ sampling carried out during the visit along with the results were discussed during the meeting.

The Ambient Air Quality Monitoring (AAQM) carried out during the visit was briefed and it was mentioned that concentration of PM_{10} in upwind direction observed as 139 mg/NM^3 is exceeding limit, which may be due to vehicular movement or cargo handling activities in other jetties in nearby. He further shared the analysis result of PM_{10} at both the downwind locations which are within the limit of NAAQ. Result of other parameters SO_2 and NOx at all the three locations are found within limit of NAAQs. During presentation, it was informed that industrial unit has stopped Phosphoric Acid Plant (PAP) and Di-Ammonium Phosphate plant(DAP) completely.

It was informed that the source emission monitoring was carried out in the following operational stacks which are selected by the visiting team basis of criticality: (1) Main stack slag cleaning furnace of smelter-1; (2) Common Stack attached to secondary scrubber of Smelter-1 & Copper scrap melting furnace of Smelter-1; (3) Main stack of Sulphuric Plant-1; (4) main stack of Sulphuric Plant-3 and (5) Stack attached to centralized scrubber system of smelter-3.

Result of source emission was deliberated at length and observed that analysis result of all stacks for all parameters are found within norms specific in CCA.

Dr. Chinmay Ghoroi asked that unit was found non-complying at various occasions in past and now is complying to which RO GPCB informed that the unit has presently stopped PAP and DAP plants permanently due to which spillages from cooling tower and emissions have been stopped, apart from various corrective measures taken by the industrial unit.

Shri S. Pradeep Raj further informed regarding monitoring of wastewater management and mentioned that samples were collected from final outlet of ETP which was found within permissible limit of CCA. All the storm water drains within the premises are observed empty and no flow observed going outside the premises.
Location of discharge was deliberated at length and it was mentioned that deep sea discharge point is suggested by NIO and accordingly unit is discharging the RO reject in deep sea and analysis results of the RO reject is meeting the discharge norms prescribed in CCA

Hon'ble Chairman enquired about the mechanism being adopted to ensure the proper disposal of the RO reject in the deep sea at the point suggest by NIO. RO- GPCB clarified that the unit has provided flow meter at the final outlet of RO which ensure the quantity of RO reject being disposed in the deep sea and also the pressure change in the final discharge pump will indicate the disturbance in the disposal line due to pipeline or diffusers blocks if any. Hon'ble Chairman also suggested that surprise checks on the deep Sea discharge shall be done on regular basis.

The unit has provided 10 nos. of Peizometric bore well around their captive SLF in their premises and earmarked all the borewells as Bore Well No.01 to Bore Well no. 10. Samples were collected from all the 10 peizometric bore wells during the visit to assess the probable contamination of groundwater due to SLFs. Analysis of bore well result were deliberated at length. It was noted that TDS content of samples are varying at different locations. RO, Bharuch mentioned that this may be due to the varying depth of piezometer wells.

The Unit has provided leachate collection sumps for collection leachate from the SLFs. During the visit, leachate samples were collected from the leachate collection sumps of active SLF (SLF 8A & 8B) to know the characterization of leachate. It was mentioned there are total 8 cells off which 7 are closed and 8A and 8B cells are active.

Results of leachate from secured land fill site collected during the visit were also deliberated. The analysis results reveals that concentration of COD are 22 and 36mg/L in samples collected from sump no.01 & sump no.05 respectively. BOD concentration is 5.2 and 18mg/L in samples collected from sump no.01 & sump no.05 respectively. The concentration of Cr+6 are BDL in both the samples. The concentrations of phenolic compounds are 0.192 & 0.270 mg/L in samples from sump no.01 & sump no.05 respectively. The leachate being collected in the leachate collection sumps are being taken to the ETP for further treatment.

Shri S.Pradeep Raj further explained the details of samples collected from shallow water ponding in reserved forest area located to the North of factory boundary where copper slag has been dumped by the unit and still lying in that area. Results were deliberated and found that the concentration of Copper, Cadmium Manganese and Zinc are 2.0 & 1.4 mg/L, 0.28 & 0.61 mg/L, 3.2 & 5.5mg/L, 0.61 &2.95 mg/L in location1 & 2 respectively. The COD concentrations are 396 & 281 mg/L and BOD concentrations are 140 & 98 mg/L in samples collected at locations 1 & 2 respectively. The TDS concentrations are 15624 & 14317mg/L at locations 1 & 2 respectively. The chloride and Sulphate concentrations are 2371 & 2316 mg/L and 6886 & 6850mg/L at locations 1 & 2 respectively. The concentrations of Arsenic,

Chromium, Lead, Molybdenum, Mercury, Sulphide, Antimony, Cobalt, Cyanide in both the samples are BDL.

During presentation Dr.Yogesh kumar, Scientist 'C' from MOEFCC has informed that BISAG has submitted the Satellite map (LISS IV and Sentinel) as per the area of interest (AOI) provided by the forest department. The false colour composite (FCC) image since 2004 up to 2021 has inferred that the dumping of copper slag in the reserve forest has significantly less impact on the health of surrounding vegetation. The area near the boundary was found low lying area which results in ponding of water thus a scarce vegetation was found.

During the visit, the soil samples were collected at 7 different locations in the reserved forest area located north to the factory premises and from 1 location inside the factory premises in the 16 Ha land to assess the probable contamination of the area due to dumping of copper slag by the industry in the said reserve forest area. Two samples collected from each location. One sample collected at the depth of 0.5m and another sample collected at a depth of 1.5m from the ground level. The samples were collected in presence of representative of Forest Department.

Analysis results of all the soil samples were deliberated and found that concentrations of Cobalt, Lead, Molybdenum and Mercury in all the samples are BDL. The concentration of Copper in the samples are in the range of 42 to 96 mg/kg, the concentration of Cadmium are in the range of BDL to 1.3 mg/kg, the concentration of Manganese are in the range of 182 to 1209 mg/kg, the concentration of Nickel are in the range of 34 to 52 mg/kg and the concentration of Zinc are in the range of 28 to 90 mg/kg.

Dr.Chinmay Ghoroi suggested that the analysis results of the soil samples may be compared with available relevant environmental standards or screening & response levels/ standards to assess the level of contamination and the need for remediation if found contaminated.

Shri S. Pradeep Raj of CPCB further informed the committee regarding development of internal roads, wind screen around the coal yard and coal yard with covered conveyers, transfer towers, containment wall, bag filters for transfer tower and crusher, sprinkler system at all sides of coal yard, mist canon system for coal discharge observed during the visit along with photographs and also briefed about the mangroves developed in the CRZ area observed during the visit. He also prepared the compilation of the data of copper slag generation and it's sale by the unit for the period Jan 2021 to Jan 2022 and also described the year-wise details of plantation done by the unit.

Conclusion

Honourable Chairman of the committee concluded meeting with the following decisions:

- Joint team constituted by Hon'ble NGT vide order dtd 05.01.2022 will carry out inspection of the industrial unit on 30th and 31st March 2022.

The meeting was concluded with vote of thanks to the Chair.

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GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
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By R.P.A.D.

CONSOLIDATED CONSENT AND AUTHORIZATION(CC & A)
CCA NO: AWH- 108216

NO: GPCB/BRCH/CCA-310(19)/ID-15178/ _____ **DT: ___/09/2020**

In exercise of the power conferred underSection-25of the Water (Prevention and Control of Pollution)Act-1974, under Section-21 of the Air (Prevention and Control of Pollution)Act-1981 and Authorization under rule 6(2) of the Hazardous & Other Wastes (Management and Trans boundary Movement) Rules-2016, framed under the E(P)Act-1986.

And whereas Board has received consolidated application dated **30/01/2020** and inward no. **171166** for the consolidated consent and authorization (CC & A)of this Board under the provisions / rules of the aforesaid Acts, Consolidated Consent & Authorization is hereby granted as under.

CONSOLIDATED CONSENT AND AUTHORISATION:
(Under the provisions / rules of the aforesaid Environmental Acts)

To,
M/s. HINDALCO INDUSTRIES LTD.,
PLOT NO: 2,10,11,43,
AT & POST DAHEJ, LAKHIGAM
TAL: VAGRA, GIDC ESTATE DAHEJ,
DIST-BHARUCH.

1. **Consent Order No. : AWH-108216 date of Issue 30/05/2020.**
2. The consent under Water Act-1974 for conveying the industrial treated effluent discharge to deep sea, The consent under Air Act-1981 & Authorization under Environment (Protection) Act, 1986 shall be **valid up to 02/03/2026** to operate industrial plant to manufacture following products:

Sr. No.	Products	Quantity(MT/Annum)
1.	Copper Cathode	500000
2.	Sulphuric Acid (98.4 %)	1470000
3.	Oxygen (Tech)	780000
4.	Gold	26
5.	Silver	200
6.	CC Rod	484000
7.	Phosphoric Acid (as P2O5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60
10.	Copper Wire (≤4 mm dia) through Mechanical Drawing Process.	60000

Outward No:568901, 30/09/2020

Sr No.	Name of By-Product	Quantity
1.	Selenium	60 TPM
2.	PGM Concentrate	0.0508 TPM
3.	Granulated Slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	Hydrofluosilic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

Specific conditions:

a) Unit shall comply with all the conditions stipulated by SEIAA / MoEF in the order of Environment Clearance issued vide letter No.J-11011/07/94-IAII(I) dated 14/03/1995 No.J-11011/81/2000-IAII (I) dated 08/01/2002, No.J-11011/86/2002-IAII (I) dated 10/02/2004, No.J-11011/220/2002-IAII (I) dated 18/03/2005, No. J-11011-927/2008-IA-II (I) dated11/02/2009 and No. J-11011-927/2008- IA-II (I) dated.23/02/2017.

b) Unit shall sell out their hazardous waste to authorized end users who is having authorization with valid CCA and rule 9 permission to receive this waste. Unit shall make MoU with such authorized end users and submit MoU.

c) All the efforts shall be made to send hazardous waste to cement industry for Co-processing first & there after it shall be disposed through other option.

d) Unit shall follow coal handling guideline framed by Board and provide close ash handling facility.

e) Unit shall strictly follow the Fly Ash Notification for disposal of generated ash.

f) Unit shall install online Continuous Emission Monitoring Systems (CEMS) and link it with the server of GPCB for real time data transfer for boiler more than 8 TPH capacity or equivalent capacity of TFH.

3. CONDITION UNDER THE WATER ACT:

3.1 The quantity of total water consumption shall not exceed **39742 KL/Day** as per below break up as mentioned in form D submitted for consent application under the Water Act- 1974.

a) Industrial: **38524** KL/Day
b) Domestic: **1218** KL/Day

3.2 The quantity of total waste water generation shall not exceed **5161 KL/DAY** as per below break up as mentioned in form D submitted for consent application under the Water Act- 1974.

a) Industrial: **4755** KL/Day (Including R.O reject 1000 KL/day)
b) Domestic: **406** KL/Day

3.3 Mode of disposal of wastewater:

a) The treated effluent conforming to the standards as per condition no. 3.4 shall be reutilized as per specific condition no. (III) of Environment Clearance Certificate

Outward No:569901/2019/2030

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dated: 18/03/2005 i.e. unit shall use 1330 M3/Day of treated effluent for greenbelt development. 475 M3/Day of treated effluent for lime slurry preparation. 480 M3/Day of treated effluent for make up in slag granulation and remaining 370 M3/Day of treated effluent in gas cleaning section. However, additional treated effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO specifically for the effluent generated from copper smelter Plant I & II. There shall not be any discharge outside the premises for the effluent generated from copper smelter Plant-III. The treated effluent should conform to the marine environmental standards as specified as per condition no. 3.4.

b) The Sewage from the entire complex shall be treated separately to conform to the following and utilized on land for gardening and plantation only.

Sr. No.	PARAMETERS	PERMISSIBLE LIMIT
1	Biochemical Oxygen Demand, BOD_3, 27° C	20 mg/L
2	Total Suspended Solids (TSS)	30 mg/L
3	Total Residual Chlorine	Minimum 0.5 ppm

c) The company should operate a separate online Fish pond using treated effluent to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to the Ministry's Regional office at Bhopal/CPCB/GPCB.

d) Adequate facilities and safety measures including protective clothing for personnel working in the critical area. e.g. in the anode casting area must be strictly explored.

3.4 The quality of industrial effluent shall conform to the following standards (as per GPCB norms, whichever is applicable) (additional treated effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO)

Sr. No.	PARAMETERS	PERMISSIBLE LIMIT
1	pH	5.5-9.0
2	Temperature	45°C
3	Colour(Pt,Co.scale)	100 units
4	Total suspended solids	100 mg/l
5	BOD(3 days at 27o C)	100 mg/l
6	COD	250 mg/l
7	Oil and Grease	20 mg/l
8	Phenolic Compounds	5 mg/l
9	Ammonical Nitrogen	50 mg/l
10	Sulphides	5 mg/l
11	Cyanides	0.2 mg/l
12	Fluoride	10 mg/l
13	Hexavalent Chromium	1.0 mg/l
14	Total Chromium	2.0 mg/l
15	Copper	3.0 mg/l

Outward No:568902 / 30/03/2010

16	Nickel	5.0 mg/l
17	Zinc	15.0 mg/l
18	Mercury	0.01 mg/l
19	Lead	1.0 mg/l
20	Arsenic	0.2 mg/l
21	Cadmium	2.0 mg/l
22	Insecticide/Pesticide	Absent
23	Selenium	0.05 mg/l
24	Bio-Assay Test	90 % survival of fish after 96 hours in 100 % effluent

3.5 The treated effluent conforming to the above standards shall be reutilized in the process.

3.6 Unit shall implement & follow communication plan so that respected work can be done in minimum response time in case of emergencies.

3.7 Unit shall install continuous / online monitoring system and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as pH, BOD,COD, TSS, other sector specific parameters etc. with recorder & magnetic flow meters for flow measurement of treated wastewater as per CPCB guideline.

3.8 Unit shall make fixed arrangement for discharge of the effluent from their Final collection tanks. Unit shall not keep any by-pass line or system or loose or flexible pipe line for discharge of the effluent into underground drainage network of Pipeline.

3.9 Magnetic flow meters shall be installed at the inlet & outlet of effluent collection tanks/ETP to measure the quantity of effluent.

3.10 Unit shall affix of water meters as per Section 4 (1) of the water (Prevention and Control of Pollution) Cess Act - 1977 for the purpose of measuring and recording the quantity of water consumed at such places as may be required.

3.11 Unit shall provide adequate / safe effluent sampling facility for the effluent being stored in final collection / discharge tank of ETP.

3.12 Unit shall put up at the entrance a board displaying the name of unit, particulars of the products/ process, the name of proprietor/partners /directors of the unit.

3.13 Unit shall have to display on-line data outside the main factory gate with regard to and nature of hazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises, if applicable as per CPCB norms.

3.14 Unit shall either stop or curtail its production activities if the effluent is not conforming to the standards of GPCB.

3.15 Unit shall keep accurate records of quantity of production of each product, quantity of water consumption, quantity of effluent generated and consumption of electricity

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on day to day basis and required to submit the complied record of each month to GPCB on or before fifth day of the succeeding month.

3.16 Disposal system for storm water shall be provided separately. In no circumstances storm water shall be mixed with the industrial effluent.

3.17 Leachate from the Secured Land Fill, if any shall alsobe connected into a collection tank through leachate collection facilities and shall be treated along with industrial effluent.

3.18 The Environmental Management Unit/Cell shall be setup to ensure implementation on and monitoring of environment safeguards and other conditions stipulated by statutory authorities. The Environmental Management Cell / Unit shall directly report to the Chief Executive of the organization and shall work as a focal point for internalizing environmental issued. These Cells also coordinate the exercise of environmental audit and preparation of environmental statements.

3.19 The Environmental audit shall be carryout yearly, if applicable. The environmental statements pertaining to the previous year shall be submitting to this State Board latest by 30th September every year.

3.20 In case of change of ownership/ management the name and address of, the new ownership/ partners/ directors/ proprietor should immediately be intimate to the Board. Also any change in equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

3.21 The Board reserves the right to review and/or revoke the consent and / or make modifications in the conditions which it seems fit in accordance with provisions of Water Act-1974.

4. CONDITIONS UNDER THE AIR ACT:

4.1 The following shall be used as fuel:

Sr. No.	Name of fuel	Quantity in TPM
1.	HSD	900
2.	HFO	1530
3.	Imported Coal	36980
4.	LNG(SCM)	1486197

4.1.1 The flue gas emission through stack shall conform to the following standards:

Stack No.	Stack attached to	Stack Height in Meter (From G.L.)	Air Pollution Control Measure (APCM)	Parameter	Permissible limit
1.	Dore furnace of PMR Plant	45	Bag Filter	PM SO2 NOx	150 mg/Nm³ 100 ppm 50 ppm

Outward No:568001, 30/09/2020

2.	Package boiler	43	Scrubber	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
3.	Sulphuric Acid Preheater -I	30	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
4.	Sulphuric Acid Preheater -II	30	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
5.	DG Set –I	30	Cyclone Separator	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
6.	DG Sets-II	30	Cyclone Separator	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
7.	Captive Power Plant (CPP-I) CFBC Boiler 35 MW	75	ESP + lime dosing system	PM SO2 NOx	100 mg/Nm^3 600 mg/Nm^3 600 mg/Nm^3
8.	Shaft Furnace of CCR Plant-I	26	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
9.	Shaft Furnace of CCR Plant-II	26	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
10.	Sulphuric Acid Preheater -III	38	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
11.	Captive Power Plant (CPP-II) AFBC Boiler 15.34 MW	60	ESP + lime dosing system	PM SO2 NOx	100 mg/Nm^3 600 mg/Nm^3 600 mg/Nm^3
12.	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP + lime dosing system	PM SO2 NOx Mercury	50 mg/Nm3 600 mg/Nm^3 300 mg/Nm^3 0.03 mg/NM^3
13.	Shaft Furnace of CCR Plant-III	35	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm

4.2 The Process emission through various stacks/ vent of reactors, process, vessel shall conform to the following standards:

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Stack No.	Stack attached to	Stack Height in Meter (From G.L.)	Air Pollution Control Measure (APCM)	Parameter	Permissible limit
1.	Anode Casting of Smelter-I	20	--	PM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3
2.	Main stack Secondary Gas Scrubber of Smelter-I	75	Two stage alkali Scrubber	SO2	40 mg/Nm3
3.	Copper scrap melting furnace (Cap,50 TPD) of Smelter-I				
4.	Main stack Slag Cleaning Furnace of Smelter-I	75	Bag filter	PM SO2	150 mg/Nm3 40 mg/ Nm3
5.	Main Stack Sulphuric Acid Plant-I	75	5 stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2.0 Kg per Ton of 100 % conc. Sulphuric Acid
6.	Cathode Stripping M/C Plant-I of Refinery-I	20	--	SO2	40 mg/Nm3
7.	Anode scrap Washing M/C of Refinery-I	20	--	SO2	40 mg/Nm3
8.	Liberator Stack of Refinery-I	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
9.	Slag Granulation of Smelter-I	45	--	SPM	150 mg/Nm3
10.	Steam Dryer of Copper concentrate of Smelter-I	58	Bag Filter	PM SO2	150 mg/Nm3 40 mg/ Nm3
11.	Slag Cleaning Furnace (By Pass vent) of Smelter-I	46	Bag Filter	PM SO2	150 mg/Nm3 40 mg/ Nm3

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12.	Cathode Stripping M/C Plant-II of Refinery-II	20	--	SO2	40 mg/Nm3
13.	Centralized Scrubbing System Smelter-III	75	Bag Filter + Alkali Scrubber	PM SO2	150 mg/Nm3 40 mg/ Nm3
14.	Sulphuric Acid Plant-III	75	5 stage DCDA system & Mist Eliminator Tail Gas Scrubber based on Dynawave scrubber	Acid Mist SO2	25 mg/Nm3 1.0 Kg per Ton of 100 % conc. Sulphuric Acid
15.	Cathode Stripping M/C Refinery-III	20	--	SO2	40 mg/Nm3
16.	Liberator Stack of Refinery-III	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
17.	DAP	60	Dual media Scrubber	PM SO2 NOx NH3 HF	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3 175 mg/Nm3 6.0 mg / Nm3
18.	PS Convertor area (Gases are to be transferred to H2SO4 plant) only emergency vent	47	--	PM SO2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg / Nm3
19.	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6.0 mg/ Nm3
20.	PMR Plant Phase -III	30	Bag Filter	PM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3

4.3 The concentration of the following parameters in the ambient air within the premises of the unit shall not exceed the limits specified hereunder.

Sr. No.	Parameters	Permissible Limit (microgram /m³)	
		Annual	24 Hours Average
1.	Particulate Matter (PM_{10})	60	100
2.	Particulate Matter ($PM_{2.5}$)	40	60
3.	Oxides of Sulphur (SO_x)	50	80
4.	Oxides of Nitrogen (NO_x)	40	80

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- **Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.**
- **24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.**

4.4 Unit shall operate industrial plant / air pollution control equipment very efficiently and continuously so that the gaseous emission always conforms to the standards specified as above.

4.5 The consent to operate the industrial plant shall lapse if at any time the parameters of the gaseous emission are not within the tolerance limits specified as above.

4.6 Unit shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

4.7 Unit shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB(a) during day time and 70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.

4.8 All efforts shall be made to control VOC emissions and odor problem, if any.

4.9 Total control of odor nuisance from the plant premises, shall be achieved & maintained by the unit continuously

4.10 Unit shall install continuous / online monitoring system in the stacks and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as PM, SO2, NOx, other sector specific parameters etc., if applicable as per CPCB guideline.

5 GENERAL CONDITIONS: -

5.1 In case of change of ownership/ management the name and address of the new ownership/ partners/ directors/ proprietor should immediately be intimate to the Board. Also any change in equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

5.2 Unit shall put up at the entrance a board displaying the name of unit, particulars of the products/ process and the name of proprietor/partners /directors of the unit and the electricity consumer number as on the record of DGVCL.

6. AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 6(2)).

6.1 Number of authorization: **AWH-108216 date of Issue 30/05/2020.**

6.2 **M/s. HINDALCO INDUSTRIES LTD.** is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT No.2,10,11,43,** AT &PO DAHEJ, LAKHIGAM, TAL.VAGRA, **GIDC ESTATE DAHEJ, DIST: BHARUCH.**

Sr. No.	Name of Haz. Waste	Category Number	Quantity	Facility
1	ETP waste sludge & Scrubber waste	8.2/I	175095 TPA	Collection ,Storage, transportation and

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	(Sludge & Filter cakes)			disposal at own SLF site/ common TSDF of BEIL.
2	Arsenic bearing sludge, As-Cu precipitate	7.3/I	270.80 TPA	Collection in closed stainless steel vessel, recycle & treatment /encapsulation & disposed at own SLF site/ common TSDF of BEIL.
3	Used oil	5.1/I	50 KL/Yr	Collection, storage, transportation and disposal by sale to registered re -refiners
4	Spent Electrolyte solution	8.1/I	52560 KL/Yr	Collection, Storage, treatment in in-house ETP.
5	Residue dust from SAP	17.1/I	12 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF
6	Spent catalyst	17.2/I	160 KL/Yr	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL
7	Used Empty Drums (Empty barrels/ Containers/ liners contaminated with hazardous chemicals /wastes)	33.1/I	200 TPA	Collection, Storage, Decontamination, Transportation and Disposal by reuse after in-house decontamination or send it to authorized decontamination facility / recycler or send back to supplier.
8	Flue gas cleaning residue (Exhaust air /gas cleaning residue)	35.1/I	864 TPA	Collection, Storage, Transportation and Recycle into process.
9	Spent resin from DM plant (Spent ion exchange resin containing toxic metals)	35.2/I	7.5 KL/Yr	Collection ,Storage, transportation and disposal at own SLF site / common TSDF of BEIL.
10	Selenium & selenium compounds.	A-8/II	6 TPA	Collection, storage, transportation and disposal by sell out to

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				authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
11	Silver compounds.	A9/III	6 TPA	Collection, storage, transportation and disposal by sell out to authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
12	Inorganic Acid (Spent Acids)	B15/II	66960 TPA	Collection, storage, transportation and reuse to Mfg of ALF3 /disposal by sell out to authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
13	Dust & Lumpy	4/IV	35000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
14	Copper Converting or C-Slag	6/IV	6000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
15	Liberator cake	4/IV	3000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
16	Copper Revert	4/IV	72000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
17	Dore Slag (Slags from copper processing for further processing or refining)	6/IV	2500 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
18	Lead Anode/ Cathode	7./I	80 TPA	Collection, Storage, Transportation and

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				recycle in smelter or sell to recyclers.
19	Cotton waste used (Contaminated cotton rags or other cleaning materials)	33.2/I	15 TPA	Collection, Storage, Transportation and Disposal to CHWIF.
20	Used Insulation	X-X02	100 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.
21	Discarded PPE (Rubber)	X-X08	5 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.
22	Used membrane/ Filter cloth and bags	Z-Z37	20 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.

6.3 The authorization is granted to operate a facility as above.

6.4 The authorization shall be in force for a period **up to 02/03/2026**.

6.5 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

7. <u>TERMS AND CONDITIONS OF AUTHORISATION:</u>

7.1 The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.

7.2 The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the Gujarat Pollution Control Board.

7.3 The person authorised shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorisation.

7.4 Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.

7.5 The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;

7.6 The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty"

7.7 It is the duty of the authorised person to take prior permission of the Gujarat Pollution Control Board to close down the facility.

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7.8 The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.

7.9 The record of consumption and fate of the imported hazardous and other wastes shall be maintained.

7.10 The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.

7.11 The importer or exporter shall bear the cost of import or export and mitigation of damages if, any.

7.12 An application for the renewal of an authorization shall be made as laid down under Hazardous & Other Wastes (Management and Transboundary Movement) Rules-2016.

7.13 Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.

7.14 Annual return shall be filed by June 30th for the period ensuring 31st March of the year.

7.15 Unit shall have to display the relevant information with regard to hazardous waste as indicated in the Court's order in W.P. No. 657 of 1995 dated 14th October 2003.

7.16 Unit shallhave to display on-line data outside the main factory gate with regard to and nature ofhazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises.

7.17 Unit shall have to manage used or spent oil; empty or discarded barrels / containers / liners contaminated with hazardous chemicals / wastes, process waste as per Hazardous & Other Wastes (Management and Transboundary Movement) Rules-2016, framed under the E(P)Act-1986 and shall apply Authorization for all applicable waste.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(P.B Patel)
Dy. ENVIRONMENT ENGINEER

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Annexure-7

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By R.P.A.D

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution) Act-1981 and Authorization under "Hazardous Waste (Management, Handling & Trans-boundary Movement) Rule-2008."

And whereas Board has received consolidated application dated 03/03/2014 for the consolidated consent and authorization (CC & A) of this Board under the provisions / rules of the aforesaid Acts Consents and Authorization is hereby granted as under.

CONSENT AND AUTHORIZATOIN:
(Under the provisions / rules of the aforesaid environment acts)

To,
M/s. HINDALCO INDUSTRIES LTD.
AT & PO DAHEJ, LAKHIGAM,
TAL. VAGRA,
DIST: BHARUCH.

1. **Consent Order No. : AWH-62117**
2. The consent under Water Act – 1974 shall be valid up to **02/3/2019** for the use of outlet for the discharge of treated effluent & The consent under Air Act – 1981, Authorization under Environment (Protection) Act, 1986 shall be valid up to **02/03/2019** to operate industrial plant for manufacture of the following products :

Sr.No.	Name of Products	Quantity (TPA)
1.	Cathode Copper	500000
2.	Sulfuric Acid (98.4%)	1470000
3.	Oxygen (Tech)	65000 (TPM)
4.	Gold	26
5.	Silver	200
6.	CC Rod	240000
7.	Phosphoric Acid (as P_2O_5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60

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Name of By-Products		
1.	Selenium	60 TPM
2.	PGM concentrate	0.0508 TPM
3.	Granulated slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	HydroFluosilic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

3. The unit shall have to strictly adhere to the undertaking No.2242 dated 02/08/2004 & No.2243 dated 07/08/2004 submitted for their Copper Smelter plant under various Acts/ Rules.

4. All the conditions stipulated by the Ministry while according environment clearance to the existing project vide its letters No.J-11011/07/94-IAII(I) dated 14th March, 1995; No.J-11011/81/2000-IAII(I) dtd.08/01/2002, No.J-11011/86/2002-IAII(I) dtd 10/02/2004 and J-11011-927/2008-IA-II(I) dated 11/02/2009 should be strictly implemented.

5. **CONDITION UNDER THE WATER ACT:-**

The quantity of total waste water generated shall not exceed **5121 KL/Day** (break up as below):

a) Domestic – **406 KL/Day**

b) Industrial – **4715 KL/Day (Including R.O. reject 1000 KL/day)**

6. **TRADE EFFLUENT:-**

6.1 The industrial effluent shall conform to the following standards :

PARAMETERS	PERMISSIBLE LIMIT
pH	5.5 to 9
Temperature	45 °C
Colour (Pt. Co. scale)	100 units
Total suspended solids	100 mg/l
BOD (3 days at 27 °C)	100 mg/l
COD	250 mg/l
Oil and Grease	20 mg/l
Phenolic Compounds	5 mg/l
Ammonical Nitrogen	50 mg/l

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Sulphides	5 mg/l
Cyanides	0.2 mg/l
Fluorides	10 mg/l
Hexavelent Chromium	1 mg/l
Total Chromium	2.0 mg/l
Copper	3 mg/l
Nickel	5 mg/l
Zinc	15 mg/l
Mercury	0.01 mg/l
Lead	1 mg/l
Arsenic	0.2 mg/l
Cadmium	2 mg/l
Insecticide / Pesticide	Absent
Selenium	0.05 mg/l
Bio-Assay test	90% Survival of fish after 96 hours in 100% effluent.

6.2 "The treated effluent conforming to the above standards shall be reutilized as per specific condition no. (III) of Environment Clearance Certificate dated 18/03/2005 i.e. unit shall use 1330 M3/Day of treated effluent for greenbelt development, 475 M3/Day of treated effluent for lime slurry preparation, 480 M3/Day of treated effluent for make up in slag granulation and remaining 370 M3/Day of treated effluent in gas cleaning section. However, additional treated effluent or during the rainy season, effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO specifically for the effluent generated from copper smelter plant I & II. There shall not be any discharge outside the premises for the effluent generated from copper smelter plant III. The treated effluent should conform to the marine environmental standards, as specified above. The quantity of total waste water generated shall not exceed 5121 KL/day which includes 406 KL/day domestic and 4715 KL/day industrial (including 1000 KL/day RO Reject).

6.3 The sewage from the entire complex shall be treated separately to conform to the following standards and utilized on land for gardening and plantation only.

BOD (5 days at 20 °C)	Less than 20 mg/l
Suspended Solids	Less than 30 mg/l
Residual Chlorine	Minimum 0.5 ppm

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6.4 The company should operate a separate online Fish pond using treated effluent to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to the Ministry's Regional office at Bhopal / CPCB / GPCB.

6.5 Adequate facilities and safety measures including protective clothing for personnel working in the critical area, e.g. in the anode casting area must be strictly explored.

7. CONDITIONS UNDER THE AIR ACT:-

7.1 The following shall be used as fuel in Boiler / furnace / heater.

DETAILS OF FUEL CONSUMPTION		
Sr No	Detail of fuel	TPM
1	Naphtha	3504
2	HSD	900
3	HFO	3959
4	Imported Coal	36980
5	Propane	5616
6	LNG (SCM)	1486197

Phase-I &II	PLANT	NAME OF FUEL	QUANTITY
Boiler	Super heater for WHB of Copper Smelter-II plant	Naphtha	600 Kg/Hr
Heater	Pre-heater in H2SO4 Plant	Naphtha	1.0 T/Hr
Furnace	Smelting furnace (F-1) of Smelter II Plant	HFO	0.5 T/Hr
	Converting Furnace (F-3) of Smelter II Plant	Naphtha HFO	0.3 T/Hr 0.1 T/Hr
	Anode Furnace of Smelter II Plant	Naphtha Propane	0.4 T/Hr 1.0 T/Hr
	PMR Plant	Propane	0.075 T/Hr
Phase-III			
	Sulphuric Acid Plant-III	Naphtha	1.5 T/Hr
	Captive Power Plant	Imported Coal	31.6 T/Hr
	Copper Scrap Melting Furnace	LNG	5400 SCM/day

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7.2 The applicant shall install & operate a comprehensive adequate air pollution in order to achieve prescribe norms control system so as to achieve standards.

7.2.1 The flue emission through stack attached to boiler / furnace / heater / shall conform to the following standards.

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1)	Dore Furnace of PMR Plant	45	Bag Filter	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
2)	Package Boiler	43	Scrubber	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
3)	Sulphuric Acid Pre Heater-I	30	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
4)	Sulphuric Acid Pre Heater-II	30	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
5)	D.G. Set-I	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
6)	D.G. Set-II	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
7)	Captive Power Plant (CPP-1) CFBC Boiler 35 MW	75	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
8)	Shaft Furnace of CCR plant-I	26	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm

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9)	Shaft Furnace of CCR plant-II	26	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
10)	Sulphuric Acid Pre Heater-III	38	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
11)	Captive Power Plant (CPP-II) AFBC Boiler 15.34 MW	60	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
12)	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm

7.2.2 The process emission through various stacks / vent of reactors, process, vessel shall conform to the following standards :

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1	Anode Casting	20	-	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3
2	Main Stack Secondary Gas Scrubber	75	Two stage alkali Scrubber	SO2	40 mg/Nm3
3	Copper Scrap Melting Furnace (Cap. 50 TPD)				
4	Main Stack Slag cleaning Furnace	75	Bag Filter	SO2 SPM	40 mg/Nm3 150 mg/Nm3

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5	Main Stack Sulphuric Acid plant I	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2 Kg per ton of 100 % conc. Sulphuric acid
6	Cathode Stripping M/C plant-I	20	-	SO2	40 mg/Nm3
7	Anode scrap washing M/C	20	-	SO2	40 mg/Nm3
8	Liberator Stack	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
9	Slag Granulation	45	-	SPM	150 mg/Nm3
10	Steam Dryer for copper concentrate.	58	Bag Filter	SPM SO2	150 mg/Nm3 40 mg/Nm3
11	Slag Cleaning furnace (By pass Vent)	46	Bag Filter	SPM SO2	150 mg/Nm3 40 mg/Nm3
12	Smelter-II Scrubber	75	Alkalis Scrubber	SO2	40 mg/Nm3
13	Cathode Stripping M/C plant-II	20	-	SO2	40 mg/Nm3
14	Centralized Scrubbing System Cu-III	75	Bag Filter +alkali Scrubber	SPM SO2	150 mg/Nm3 40 mg/Nm3
15	Sulfuric Acid Plant SAP-III	75	5 Stage DCDA, Mist Eliminator +Scrubber	SO2 Acid Mist	1 kg per ton of 100 % conc. Sulphuric acid 25 mg/Nm3
16	Cathode Stripping Refinery-III	20	-	SO2	40 mg/Nm3
17	Main Stack Sulphuric Acid plant II	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2 Kg per ton of 100 % conc. Sulphuric acid
18	Coal Feeder	34	Bag Filter	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3

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19	DAP Plant	60	Dual media scrubber	SPM SO2 NOx NH3 HF	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3 175 mg/Nm3 6 mg/Nm3
20	PS Converter Area (Gases are to be transferred to H2SO4 plant) only emergency vent	47	-	SPM SO2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg/Nm3
21	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6 mg/Nm3
22	PMR Plant Phase-III	30	Bag Filter	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3

NOTE : Total Lead/Zinc/Copper in the gaseous emission shall not exceed 20 mg/Nm3.

7.2.3 Ambient air quality within the premises of the industry shall conform to the following Standards:

PARAMETER	PERMISSIBLE LIMIT
Suspended Particulate Matter (size less than 10um)or PM10 µg/m3**	100 microgram per cubic meter
Suspended Particulate Matter (size less than 2.5 um)or PM2.5 µg/m3**	60 microgram per cubic meter
Oxides Of Sulphur**	80 microgram per cubic meter
Oxides Of Nitrogen**	80 microgram per cubic meter
HCL	200 microgram per cubic meter
Cl_2	100 microgram per cubic meter
H2S	500 microgram per cubic meter
Ammonia	400 microgram per cubic meter
HF	60 microgram per cubic meter
CO	5000 microgram per cubic meter

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** 24 Hourly or 08 hourly or 01 Hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time; they may exceed the limits but not on two consecutive days of monitoring.

Note: - Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

7.2.4 The applicant shall operate industrial plant / air pollution control equipment very efficiently and continuously so that the gaseous emission always conforms to the standards specified in condition no.7.2.1 and 7.2.2 & 7.2.3 above.

7.2.5 The consent to operate the industrial plant shall lapse if at any time parameters of the gaseous emission are not within the tolerance limits specified in the condition no.7.2.1 and 7.2.2 & 7.2.3 above.

7.3 The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

7.4 The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. to 6 a.m.

8. GENERAL CONDITIONS:-

8.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

8.2 Applicant shall also comply with the general conditions given in annexure I.

8.3 Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Court's order in W.P.No.657 of 1995 dated 14th October 2003.

8.4 Industry shall have to display on-line data outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant including waste water and air emissions and solid hazardous waste generated within the factory premises.

8.5 The unit shall strictly comply with the rules & regulations under manufacture, storage & import of Hazardous Chemicals Rules-1989 as amended in October, 1994 & January-2000.

9. AUTHORIZATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 3 (c) & 5 (5)).

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Form for grant authorization for occupier or operator for handling hazardous waste.

9.1 Number of authorization : **AWH-62117.**

9.2 M/s. HINDALCO INDUSTRIES LTD is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT AT & PO DAHEJ, LAKHIGAM, TAL. VAGRA, DIST. BHARUCH.**

Sr. No.	Waste	Quantity	Schedule	Mode of Disposal
1	ETP waste sludge & Scrubber waste	175095 TPA	7.5 / I	Collection, Storage, transportation and disposed at Own SLF site.
2	Arsenic bearing sludge, As-Cu precipitate	270.80 TPA	7.3 / I	Collection in closed stainless steel vessel, recycle & treatment/ encapsulation & disposed at own SLF site.
3	Used oil	35 Kl/Yr	5.1 / I	Collection, storage, transportation and disposal by sale to registered re-refiner.
4	Spent electrolyte solution	52560 Kl/yr	8.1 / I	Collection, Storage, Treatment in inhouse ETP.
5	Residue/ dust from SAP	12 TPA	17.1 / I	Collection, storage, transportation and recycle into process.
6	Spent catalyst	29 Kl/yr	17.2 / I	Collection, storage, transportation and reuse into process OR treatment/ disposal at own SLF site.
7	Used empty drums	780 No/yr	33.3 / I	Collection, storage, cleaning, transportation and disposal by sale to traders.
8	Flue gas cleaning residue	864 TPA	34.1 / I	Collection, storage, transportation and recycle into process.
9	Spent resin from DM plant	7.5 Kl/yr	34.2 / I	Collection, Storage, transportation and disposed at Own SLF site.

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10	Selenium & Selenium compound	6 TPA	A-7/ II	Collection, Storage, transportation & disposal by sale to actual users.
11	Silver compound	6 TPA	B-10 / II	Collection, Storage, transportation & disposal by sale to actual users.
12	Inorganic acid	66960 TPA	D2 / II	Collection, Storage, transportation and reuse to Mfg of AlF3/ disposal by sale to actual users.

9.3 Unit shall manage the waste as per the condition stipulated in Environmental Clearance certificate, issued by MoEF, Government of India.

9.4 Unit shall manage the Copper residue waste as per circular of CPCB.

9.5 Unit shall manage the copper-arsenic waste properly by providing storage in close stainless steel vessel before recycling.

9.6 Unit shall close the cell (TSDF) in operation as per guidelines of CPCB.

9.7 Unit shall submit time-bound action plan for minimization & reuse in accordance of Hazardous Waste rules.

9.8 Unit shall have to strictly comply with an undertaking no. **2243** dtd.**07/08/2004**.

9.9 The authorization is granted to operate a facility for collection, storage, reuse, treatment of Hazardous wastes at factory premises, transportation and disposal to Captive TSDF.

9.10 The authorization shall be in force for a period up to **dated 02/03/2019**.

9.11 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

9.12 The Collection, storage, transportation and disposal of lead batteries shall be under Batteries (Management and Handling) Rules, 2001.

9.13 **TERMS AND CONDITIONS OF AUTHORIZATION**

9.13.1 The applicant shall comply with the provisions of the Environmental (Protection) Act – 1986 and the rules made there under.

9.13.2 The authorization shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

9.13.3 The persons authorized shall not rent, lend, sell, transfer of otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.

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9.13.4 Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a breach of this authorization.

9.13.5 It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.

For and on behalf of
Gujarat Pollution control Board

(R.R.Vyas)
Environmental Engineer

NO.GPCB/BRCH-B-CCA-310 (11)/15178 216033 Dt. 11/06/2014

ISSUED TO:
M/s. HINDALCO INDUSTRIES LTD. (BIRLA COPPER),
AT & PO DAHEJ, LAKHIGAM,
TAL. VAGRA,
DIST.BHARUCH

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GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 021.
Website : www.gpcb.gov.in

GPCB

BY.R.P.A.D

NO:-GPCB/BRCH/ B-CCA-310(12)/ID-15178/ 227652 **/Dated:** 07/10/2014

Amendment to CONSENTS AND AUTHORISATION Order No:- AHW- **62117** dated **11/06/2014.**
(Under the provisions /rules of the aforesaid environmental acts)

TO.
HINDALCO INDUSTRIES LIMITED (UNIT: BIRLA COPPER)
AT & PO DAHEJ, LAKHIGAM,
TAL: VAGRA, DIST: BHARUCH.

In exercise of the power conferred by clause (b) of sub-section (4) of Section 25 of the Water (Prevention & Control of Pollution) Act, 1974 and sub-section (4) of Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and rule 6 of Hazardous Waste (Management Handling & Trans-boundary Movement) Rules 2008, framed under Environment (Protection) Act, 1986. The Consolidated Consent and Authorization (CC & A) vide this office Consent order no: **AWH-62117 dated 11/06/2014** is being subjected to amendment for the following conditions only.

AND WHEREAS Board has received your letter dated **28/07/2014** for the amendment (expansion of validity) of **Consolidated Consent and Authorization** (CC & A) of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby amended as under subjected to amendment for the following conditions only.

1. The validity mentioned in the condition No. 2 of the order is amended as **02/03/2020** in place of **02/03/2019.**
2. The other conditions of the CCA order no. **AWH-62117 dated 11/06/2014** shall remain unchanged.

For and on behalf of
GUJARAT POLLUTION CONTRO BOARD

(M.V.Patel)
Environmental Engineer

Annexure-8
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ક્રમાક : ક/સર્વે/૧૮/ ૫૫૮ /૦૯-૧૦.
નાયબ વન સંરક્ષકશ્રીની કચેરી,
રાજપીપલા પશ્ચિમ વન વિભાગ,
રાજપીપલા. તારીખ :૩૦/૧૨/૨૦૦૯.

વિષય :-હિન્ડાલકો ઇન્ડ. લી. દહેજ ધ્વારા લખીગામ ક.નં.૫૯૬ માં અનામત જંગલ વિસ્તારમાં નુકશાન કરવા બાબત.

પ્રસ્તુત બાબતે હકીકત એવી છે કે ભરૂચ જીલ્લાના વાગરા તાલુકાના મોજે દહેજ ગામમાં આવેલ કંમ્પાર્ટમેન્ટ નંબર-૫૯૬, સર્વે નંબર ૧૫૦૪ પૈકી વાળી વનવિભાગની અનામત જંગલ જમીન, જે હિન્ડાલકો ઇન્ડસ્ટ્રીઝ લી. (યુનિટ બીરલા કોપર) ના પ્લાન્ટ ની ઉત્તર દિશામા આવેલી છે તેમા કંપની ધ્વારા મશીનરીથી સાફસુફ કરી, જમીન લેવલ કરી કેમીકલ યુકત પ્રદૂષિત કચરો નાંખી જંગલ ભાગમાં ગેરકાયદેસર દબાણ કરી નુકશાન પહોચાડવામા આવેલ છે.તેમજ આશરે ૨૦ થી ૨૫ હેકટર જેટલા વિસ્તારમા કેમીકલ યુકત પાણી છોડવાથી ગાંડા બાવળના વૃક્ષો સુકાઇ જવા પામેલ છે.જમીન કાયમી અસરથી પ્રદૂષિત થયેલ છે. સદર વિસ્તારમા જીવજંતુઓ તેમજ પર્યાવરણને ભારે નુકશાન પહોચાડવામાં આવેલ હાવાથી ભરૂચ રેન્જના સ્ટાફ ધ્વારા આ બાબતે વખતોવખત ગુન્હાકામ નોધવામા આવેલ છે.

ગુન્હાની વિગત.

(૧) દહેજ રા.ગુ.નં. ૭/૦૬-૦૭ તા.૩૦-૦૧-૦૭.

રાઉન્ડ ફોરેસ્ટર દહેજના પ્ર.ગુ.રી.નં.૬/ તા.૨૯-૧-૦૭ તથા રા.ગુ.નં.૭/૦૬-૦૭ અંતર્ગત નોંધવામાં આવેલ ગુનાકામ ભારતીય વન અધિનિમય-૧૯૨૭ની કલમ-૨૬(૧)(ક)૨૬(૧)(ગ)અને૨૬(૧)(ચ) હેઠળ નોંધવામાં આવેલ છે. સદર કંપની ધ્વારા આ બીજીવારનો ગૂનો આચરેલાનુ જણાય આવેલ છે.સદર ગુન્હાકામે નુકશાનીનો અંદાજ મેળવવા સબબ મદદનીશ વન સંરક્ષકશ્રી સા.વ.યો. ભરૂચને તપાસ સોપતા તેમના તા.૨૨-૦૯-૨૦૦૯ના પત્રથી કુલ નુકશાની રૂા.૩,૫૦,૦૦૦/-(અંકે રૂપિયા ત્રણ લાખ પચાસ હજાર પુરા)ની દર્શાવી. વળતર પેટે વધુ રૂા.૨૦૦૦/-(બે હજાર પુરા) વસુલ લેવા વિનંતી કરવામા આવેલ છે.

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(૨) દહેજ રા.પ્ર.ગુ.નં. /૦૭-૦૮ તા.૧૧-૦૯-૦૭

રેંજ ફોરેસ્ટ ઓફિસરશ્રી ભરૂચના પ્ર.ગુ.રી.નં.૧/૦૭-૦૮ તા.૧૧-૦૯-૦૭ તથા રા.ગુ.નં.૩/૦૭-૦૮ અનુસાર પુઝર એજન્સી ધ્વારા જંગલ જમીન ઉપર પ્રદુષિત પાણી છોડવાના તથા ઘન કચરો નાંખવાના ગુન્હાકામે રૂા.૩,૬૦,૦૦૦/-(અંકે રૂપિયા ત્રણ લાખ સાઇઠ હજાર પુરા)નુકશાની તથા વળતર રૂા.૨૦૦૦/- દર્શાવી રેંજ પાવતી નં.૨૨૫૭૭૮ તા.૧૮-૦૯-૦૭ થી રૂા.૧,૫૦,૦૦૦/- ડિપોઝીટ તરીકે જમા લેવામાં આવેલ છે. ઉકત ગુન્હો ભારતીય વન અધિનિમય-૧૯૨૭ની કલમ- ૨૬(૧)(એસ)(આઇ)ના ભંગ બદલ નોંધવામાં આવેલ છે.

ભારતીય વન અધિનિયમ-૧૯૨૭ની કલમ-૨૬(૧)(ક)થી(૨)સુધીના ગુનાઓ માટે અનામત જંગલમાં થયેલ નુકશાનીની રકમ તથા રૂા.૨૦૦૦/- સુધી ગુના વળતર વસુલાત અને જમીન ઉપરથી હાંકી કાઢવાની જોગવાઇ છે.

આ અગાઉ પણ સદર કંપની સામે સને ૨૦૦૪-૦૫ ના વર્ષમા રા.ગુ.નં.-૧/૦૪-૦૫ તથા ૭/૦૪-૦૫ અનુસાર આજ પ્રકારનો દબાણ સહીતનો ગુન્હો આચરવામા આવતા કંપની સામે ગુનાકામ નોધવામા આવેલ હતુ.

ઉપરોકત હકીકત જોતા સદર તમામ ગુનાકામ એજન્સી ધ્વારા એક જ વિસ્તારમાં વારંવાર કરવામાં આવેલ છે.જે કંપની ધ્વારા સંપૂર્ણ સભાન પણે આચરવામા આવેલ સુનિયોજીત ગુન્હો છે.સદર કંપની ધ્વારા પર્યાવરણ બાબતે બિલકુલ બેજવાબદારી ભર્યુ વર્તન દાખવવામા આવી રહેલ છે.જેના થકી જંગલ ભાગને પારાવાર નુકશાન પહોચેલ છે.કંપની ધ્વારા માત્ર પૈસાના જોર ઉપર વન અને પર્યાવરણ વિભાગના કાયદાઓની ઉપરવટ જઇ જંગલને નુકશાન પહોચાડવામા આવેલ છે.આ નુકશાન હવે એટલી હદે પહોચેલ છે કે આ જમીનમાં ઘાંસ કે નિંદામણ સુધ્ધાં થતુ નથી. એટલે ત્યાં અન્ય વૃક્ષોને કે વનસ્પતિને ઉગવા માટે પણ જમીન અનુકૂળ રહેલ નથી. કંપની ધ્વારા કરવામા આવેલ આ નુકશાનીને દુર કરવા ખુબજ મોંઘી અને વૈજ્ઞાનિક ઢબની સારવાર આપવી જરૂરી બનેલાનું અત્રેનું માનવુ છે આ અત્યાધુનિક સારવાર માટેનો તમામ ખર્ચ પણ

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ક્રમાંક : બ/સર્વે/૧૮/ ૧૦૩૯૪ /૦૯-૧૦.
નાયબ વન સંરક્ષકશ્રીના કચેરી,
રાજપીપલા પશ્ચિમ વન વિભાગ,
રાજપીપલા. તારીખ :૩૧/૧૨/૨૦૦૯.

વિષય :-હિન્ડાલકો ઇન્ડ. લી. દહેજ ધ્વારા લખીગામ કં.નં.૫૯૬ માં અનામત જંગલ વિસ્તારમાં નુકશાન કરવા બાબત.

આથી પરીક્ષેત્ર વન અધિકારીશ્રી ભરૂચને જણાવવાનુંકે આપના કાર્યક્ષેત્ર હેઠળ આવેલ વાગરા તાલુકાના મોજે દહેજ ગામમાં આવેલ કંમ્પાર્ટમેન્ટ નંબર-૫૯૬, સર્વે નંબર ૧૫૦૪ પૈકી વાળી વનવિભાગની અનામત જંગલ જમીન, જે હિન્ડાલકો ઇન્ડસ્ટ્રીઝ લી.(યુનિટ બીરલા કોપર) ના પ્લાન્ટ ની ઉત્તર દિશામા આવેલી છે તેમા કંપની ધ્વારા કેમીકલ યુકત પ્રદૂષિત કચરો નાંખી જંગલ ભાગમાં ગેરકાયદેસર દબાણ કરી નુકશાન પહોંચાડવામા આવેલ છે.તેમજ આશરે ૨૦ થી ૨૫ હેકટર જેટલા વિસ્તારમા જમીન કાયમી અસરથી પ્રદૂષિત કરવામા આવેલ છે. જે બાબતે સ્ટાફ ધ્વારા વખતોવખત ગુન્હાકામ નોધવામા આવેલ છે.જે પૈકી(૧) રાઉન્ડ ફોરેસ્ટર દહેજના પ્ર.ગુ.રી.નં.૬/ તા.૨૯-૧-૦૭ તથા રા.ગુ.નં.૭/૦૬-૦૭, (૨)રેંજ ફોરેસ્ટ ઓફિસરશ્રી ભરૂચના પ્ર.ગુ.રી.નં.૧/૦૭-૦૮ તા.૧૧-૦૯-૦૭ તથા રા.ગુ.નં.૩/૦૭-૦૮ થી ઉકત કંપની સામે ગુના કામ નોંધવામા આવેલ છે.ઉકત બન્ને ગુનાકામ બાબતે અત્રેના પત્રક્રમાંકઃ ક/ સર્વે/૧૮/ ૫૫૯ તા.૩૦/૧૨/૨૦૦૯ થી ફાઇનલ હુકમ કરવામા આવેલ છે.જેની નકલ આ સાથે સામેલ છે. જે ધ્યાને લઇ રકમ વસૂલ કરવા અંગેની આગળની કાર્યવાહી કરવા તેમજ જરૂરત પડયેથી યુઝર એજન્સીને ચલણ બનાવી આપવા સુચના આપવામાં આવે છે.

બિડાણ : હુકમની નકલ

(સહી)
(છ.આઇ.નાયક)
નાયબ વન સંરક્ષક
રાજપીપલા પશ્ચિમ

પ્રતિ,
પરીક્ષેત્ર વન અધિકારીશ્રી,
ભરૂચ.

રેંજ ફોરેસ્ટ ઓફીસ
ભરૂચ.
આવક નં. ૪૨૯
તા. ૬/૧/૧૦

REDMI NOTE 5 PRO
MI DUAL CAMERA

ગુન્હેગાર કંપની પાસેથી વસુલ કરવો જોઇએ એવુ અત્રેનું માનવુ છે. પરંતુ આ બાબતે યોગ્ય સત્તાએ નિર્ણય થવો જરૂરી હોય કાયદાની મર્યાદામાં રહી તેમજ વિવેક બુધ્ધી અનુસાર નીચે મુજબનો હુકમ કરવામાં આવે છે.

-: હુકમ :-

હિન્ડાલકો ઇન્ડસ્ટ્રીઝ લી. (યુનિટ બીરલા કોપર) ધ્વારા વારંવાર ગુન્હો કરી જંગલ વિસ્તારને નુકશાન પહોચાડવામા આવેલ છે. સદર કામે તેઓ પ્રથમથી જ ગુનાહિત માનસ ધરાવી વારંવાર ગુન્હો કરતા રહેલ છે. કંપની ધ્વારા સને ૦૪-૦૫ બાદ ૦૬-૦૭મા ફરીથી બીજીવારનો ગુન્હો કરવા બદલ કુલ નુકશાનીના બમણા એટલે કે રૂા.૩,૫૦,૦૦૦/-ના બમણા રૂા.૭,૦૦,૦૦૦/- તથા રૂા.૨૦૦૦/-વળતર તરીકે તથા સને ૦૭-૦૮ના વર્ષમા ત્રીજીવાર ગુન્હો કરવા બદલ કુલ નુકશાની રૂા.૩,૬૦,૦૦૦/-ના ત્રણગણા એટલે કે રૂા.૧૦,૮૦,૦૦૦/- તથા વળતર રૂા.૨૦૦૦/-મળી એકંદરે કુલ રૂા.૧૭,૮૪,૦૦૦/-અંકે રૂા.સત્તર લાખ ચાર્યાસી હજાર પૂરા વસૂલ કરવા તથા પાવતી નં.૨૨૫૭૭૮ તા.૧૮-૦૯-૨૦૦૭ થી ડીપોઝીટ પેટે જમા રકમ રૂા.૧,૫૦,૦૦૦/- મજરે લેવા અને રેવન્યુ તરીકે જમા લેવા હુકમ કરવામા આવે છે.

આજ રોજ તા.૩૦/૧૨/૨૦૦૮ ના રોજ મારી સહી તથા કચેરીના સિકકાથી હુકમ બહાર પાડવામા આવ્યો.

DY CONSERVATOR OF FORESTS RAJPIPLA WEST

(જી.આઇ.નાયક)
નાયબ વન સંરક્ષક
રાજપીપલા પશ્ચિમ

સ્થળ :- રાજપીપલા
તારીખ :-૩૦-૧૨-૨૦૦૮

પ્રતિ,
અધ્યક્ષ અને મુખ્ય કાર્યકારી અધિકારીશ્રી,
હિન્ડાલકો ઇન્ડસ્ટ્રીઝ લી.
(યુનિટ બીરલા કોપર)
દહેજ.તા. વાગરા જી.ભરૂચ.

REDMI NOTE 5 PRO
MI DUAL CAMERA

No. : B/Survey/18/10394/09-10
Office of the Deputy Forest Conservator, Rajpipla West Forest Division, Rajpipla.

Date : 31/12/2009.

Subject :- Regarding causing of damage in the reserved forest area of Lakhi Village Compartment No. 596 by Hindalco Industries Limited.

Range Forest Officer, Bharuch is hereby intimated that the reserved forestland of the Forest Department bearing Compartment No. - 596, Survey No. 1504 Paiki located in the Dahej Village of Vagra Taluka falling under your area of operation, which is located in the North direction of the plant of Hindalco Industries Limited (Unit Birla Copper), wherein the company has caused damage by illegally encroaching upon the forest department by dumping chemically polluted waste. And in about 20 to 25 hectare of land has been polluted with permanent effect. With regard to the same the staff has registered offence from time to time. Out of which, above stated offences have been registered against the company vide (1) Round Forester Dahej's F.C.R. No. 6 dated : 29/1/07 and R.C.R. No. 7/06-07, (2) Range Forester Officer, Bharuch's F.C.R. No. 1/07-08 dated : 11/09/07 and R.C.R.3/07-08. With regard to both the above stated cases of offence, final order has been passed on Date : 30/12/2009 vide this office's Letter No. : C/Survey/18/559, copy of which is attached herewith. Instruction is hereby given that the same may be taken into consideration and further proceedings to recover the

amount may be initiated and if required, challan may be prepared and handed over to the user agency.

Sd/- Illegible
(G. I. NAYAK)
For Deputy Forest Conservator
Rajpipla West

Encl. : Copy of the order

To,
Range Forest Officer,
Bharuch

Range Forest Office
Bharuch
Inward No. : 419
Date : 1/1/10

No. : B/Survey/18/559/09-10

Office of the Deputy Forest Conservator, Rajpipla West Forest Division, Rajpipla.

Date : 30/12/2009.

Subject :- Regarding causing of damage in the reserved forest area of Lakhi Village Compartment No. 596 by Hindalco Industries Limited.

The facts in the subject matter is that the reserved forest land of the Forest Department bearing Compartment Number - 596, Survey No. 1504 Paiki located in the Dahej Village of Vagra Taluka of Bharuch District is located in the North direction of the plant of Hindalco Industries Limited (Unit Birla Copper), wherein the company has by carrying out cleaning with the help of machinery and leveling the land has caused damaged by illegally encroaching upon the forest division by dumping chemically polluted waste. And by releasing chemically polluted water in the area admeasuring about 20 to 25 hectare, the trees of Ganda Bawal has dried up. The land has become polluted with permanent effect. As huge loss and damage has been caused to the insects and the environment in the said area, staff of the Bharuch range has registered offences in this matter from time to time.

Details of the Offence :

(1) **Dahej R.C. No. 7/06-07 date : 30/01/07**

Offence registered in pursuance to P.C.R. No. 6 dated : 29/1/07 and R.C. No. 7/06-07 of the Round Forester Dahej has been registered under Section 26(1)(C) 26(1)(g) and 26(1)(H) of Indian

Forest Act, 1927. It seems that such offence has been committed by the said company for the second time. In the matter of the said offence, in order to procure the estimate of the damage / loss, investigation having been handed over to the Assistant Forest Conservator, S.V.Y. Bharuch, vide its letter dated : 22/09/2009, by showing total loss / damage of Rs. 3,50,000/- (Rupees Three Lakhs Fifty Thousand only) it has been requested to recover an additional amount of Rs. 2000/- (Two Thousand only) towards compensation.

(2) **Dahej R.P.C.No. / 07-08 dated : 11/09/07:**

In the matter of the offence of dumping Solid waste and releasing of polluted water on the forest land by the user agency as per the P.C.R. No. 1/07-08 dated : 11/09/07 and R.C. No. 3/07-08 of the Range Forest Officer, Bharuch by showing a loss / damage of Rs. 3,60,000/- (Rupees Three Lakhs Sixty Thousand only) and compensation of Rs.2000/- an amount of Rs.1,50,000/- has been recovered / credited as Deposit vide Receipt No. 225778 dated : 18/09/07. The above offence has been registered for the breach of Section 26(1)(S)(I) of the Indian Forest Act, 1927.

For the offences under Section 26(1) (C) to (2) of Indian Forest Act, 1927 there is a provision of recovery of the amount of loss/damage caused in the reserved forest and recovery of offence compensation upto Rs. 2000/- and driving away out of the land.

Earlier also, offence has been registered against the company in the year 2004-05 for similar type of offence including encroachment vide R.C.No. 1/04-05 and 7/04-05.

Taking into consideration the above stated facts all the offences have been repeated by the Agency in the same area, which is a well planned offence committed in the complete present state of mind. The said company has shown totally irresponsible type of attitude with regard to the environment, as a result of which the forest portion has suffered huge loss and damage. The company has caused loss and damage to the forest simply on the strength of money and going above the laws of the Forest and Environment department. The extent of loss/damage suffered is to such an extent that now even grass or fodder cannot be grown in this land. Which means that this land has not remained comfortable for growing other tress or vegetables. It is the belief of the sources that very costly and scientific procedure of treatment is required to adopted in order to remove such loss / damage caused by the company. This office believes that all expenses towards such most modern treatment should be recovered from the offender company. But, it being necessary for decision to be taken by appropriate authority in this regard, below mentioned order is being passed using discretion intellect staying within the limitations of the law.

-: O R D E R :-

Hindalco Industries Limited (Unit Birla Copper) has caused loss / damage to the forest area by repeatedly committing offence. In the said matter, they are right from the very beginning possessing criminal mindset and have been repeatedly committing offence. It is hereby ordered to recover as revenue from the company for repeating the offence again in the year 06-07 after the offence

committed by the company in the year 04-05, double the amount of the loss/damage i.e. Rs.7,000/- which is double the amount of Rs.3,50,000/-and Rs. 2000/- towards compensation and for committing the offence for the third time in the year 07-08, an amount of Rs.10,80,000/- being three times of the total loss/damage of Rs.3,60,000/- and compensation of Rs.2000/- totaling to Rs.17,84,000/- Rupees Seventeen Lakhs Eighty Four Thousand only) and the amount of Rs.1,50,000/- recovered towards deposit vide Receipt No. 225778 dated : 18/09/2007 be adjusted.

Ordered pronounced under my signature and seal of the office on to-day Date : 30/12/2009.

Place : Rajpipla
Date : 30/12/2009

Sd/- Illegible
(G. I. NAYAK)
Deputy Forest Conservator
Rajpipla West

ROUND SEAL OF DY. CONSERVATOR
OF FORESTS, RAJPIPLA - WEST

To,
President and Chief Functional (Working) Officer
Hindalco Industries Ltd.
(Unit Birla Copper)
Dahej, Taluka Vagra,
District Bharuch

No. : B/18/Survey/10-12/09-10
Office of the Deputy Forest Conservator, Rajpipla West Forest Division, Rajpipla.
Date : 16/12/2009.

Subject :- Regarding use of 4.7325 Hectare of Forest Land by Hindalco Industries Ltd. for the expansion of the Copper Smelter Project at Dahej of Bharuch District.

Reference:- This Office's Letter No. B/18/ Survey/5973 dated : 24/08/2009.

In pursuance to and with reference to the above subject matter and Reference Range Forest Officer, Bharuch is hereby informed final approval has been received from the Government of India with regard to the proposal made in pursuance to Forest Conservation Act - 1980 for the use of the forest land admeasuring 4.7325 hectare by Hindalco Industries Limited. The User Agency has made submission with regard to the change of use in the land of the above referred forest department vide its letter dated : 3/7/09, wherein submission has been made with regard to preparing of conveyor belt in place of road.

With regard to the above stated matter, instruction having been given to submit within 3 days detailed and self explanatory report with regard to whether user agency has actually breached the terms of the letter of the Government of India by preparing conveyor

belt in place of road in the said area, till date no report has been received by this offence from them, which is undesirable. On receipt of this letter, note may be taken to submit report without expecting any further reminder.

Sd/- Illegible
(**G. I. NAYAK)**
For Deputy Forest Conservator
Rajpipla West

To,
P.V.C.,
Bharuch

Range Forest Office
Bharuch
Inward No. : 397
Date : 17/12/09

Sd/- Illegible
17/12/'09

No. : B/18/Survey/10010-11/09-10
Office of the Deputy Forest Conservator, Rajpipla West Forest Division, Rajpipla.
Date : 16/12/2009.

Subject :- Expansion of Copper Smelter & Setting up of Zeen Smelter Plant by Messers Hindalco Industries Limited at Village Lakhi Village & Dahej, District Bharuch of Gujarat.

Reference :- (1) Letter No. 8c/13/238/94-few/1832 dated : 27/07/2009 of the Forest & Environment Department.
(2) Letter No. B/JMN/16/295/6350 dated : 27/08/2009 of the Forest Conservator, Surat Circle, Surat.
(3) Letter No. : B/18/Survey/7038-39 dated : 10/09/2009 of this Office.

In pursuance to the above subject matter and reference, the Range Forest Officer, Bharuch and Divisional Office's Survey Shri S. J. Yadav is hereby intimated that as stated in the letter of the Government of India mentioned at Ref. No. - 1 hereinabove that on monitoring being carried out by the officer of the Government of India out of the proposals made by Messers Hindalco Industries under the Forest Conservation Act, 1980, violation has been found in many cases.

Inspite of instruction having been given vide Letter mentioned at Reference-3 for carrying out legal proceedings, if required, for carrying out site inspection with regard to the violation by carrying out study as per the details mentioned in letter mentioned at Reference-1, report has not been received from him. On receipt of this letter, note may be taken to procure detailed and self explanatory receipt from him and submit the same to this office receipt of this letter.

Sd/- Illegible
(G. I. NAYAK)
For Deputy Forest Conservator
Rajpipla West

To,
Range Forest Officer,
Bharuch

Copy forwarded to :
Shri S. J. Yadav, Surveyor of Division Officer for information.

Range Forest Office
Bharuch
Inward No. : 396
Date : 17/12/09

Sd/- Illegible
17/12/'09

No. : B/18/Survey/5973/09-10

Office of the Deputy Forest Conservator, Rajpipla West Forest Division, Rajpipla.

Date : 24/08/09.

Subject :- Regarding use of 4.7325 hectare of the forest land admeasuring for the expansion of the Copper Smelter project by Hindalco Industries Limited at Dahej of Bharuch District.

In pursuance to the above subject matter, the Range Forest Officer, Bharuch is hereby informed that final permission/approval has been received from the Government of India with regard to the proposal pertaining to the use of 4.7325 hectare of forest land made by Hindalco Industries Limited under the Forest Conservation Act, 1980. Recently the user agency has made submission with regard to the change of use of the land of forest department vide its letter dated : 3/7/09, wherein submission has been made to set up conveyor belt in place of road.

With regard to the above stated matter, site inspection be carried out and a detailed and self explanatory report be prepared in the matter whether actually the User Agency has breached / violated the terms of the letter of the Government of India by preparing Conveyor Belt in place of Road in the said area?. Such report may be submitted to the under signed within three days and a note thereof may be taken.

1566

Sd/- Illegible

(G. I. NAYAK)

Deputy Forest Conservator

Rajpipla West

To,

P.V.A.,

Bharuch

Range Forest Office

Bharuch (Normal)

Inward No. 251

Date : 29/8/09

Sd/- Illegible

29/8/'09

PANCHKYAS

Birla Copper Unit
Behind Hindalco Industries Ltd.
Compartment No. 596
Post Dahej
Date : 11/9/2007

Sr. No.	Name of the Panch	Village	Age	Occupation
(1)	Shri Kalpeshbhai Amarsinh Gohil	Post Lakhi Village, Taluka Vagra, Dist. Bharuch	25	Agriculture
(2)	Shri Kailashbhai Raisang Gohil	Post Lakhi Village, Taluka Vagra, Dist. Bharuch	23	Agriculture

We, the Panchas of the above referred name, address and occupation have to-day appeared in person on to-day Date : 11/9/2007 on being called by you the Range Forest Officer, Bharuch and having informed about the preparing of the Panchkyas of the loss/damage caused to the forest portion by Birla Copper Unit, Hindalco Industries Limited in Compartment No. 596, on carrying out self inspection and seeing with our eyes in person do hereby dictate and get written the Panchkyas as under:-

The area of Compartment No. 596 in the reserve forest of Village Dahej, Taluka Vagra, District Bharuch is the area applicable surrounding the biurla copper unit of Hindalco Industries Limited. This reserve forest area is the area applicable to Birla Copper Unit Factory. We, the panchas have appeared near the Jetty of Birla Copper Unit in Compartment No. 586 from where raw material is

being brought through Ship from the Sea. Below the portion of this Jetty, there is land of Birla Copper unit, but the portion applicable to it is reserve jungle portion of 596. Birla Copper Unit has cleaned and leveled this portion with the help of machinery, and the chemical waste dispensed from its plant which looks like black coloured small coal type waste_____

_____

_____

_____

The four boundaries of this area is as per the below mentioned details :-

East	:	Birla Copper Unit
North	:	Reserve Forest Compartment No. 596
West	:	Reserve Forest and the sea applicable to it.
South	:	Jetty of Birla Copper

In this area, Birla Copper Unit has caused damage / loss to the Forest portion by dumping / heaping the polluted chemical waste. On carrying out calculation of this heaps, there are 32 numbers of heaps, on which numbers written by them with white powder can be seen. On carrying out measurement of the place where this chemical waste has been dumped, it has been dumped in the area having width of 45 meter and length of 10 meters. And damage has been caused to the forest land by this chemical waste in the area measuring 28 meter wide and 54 meter of length. And also in the water that has logged in this land, the water seems to have polluted as a result of this chemical waste. In this way, we the Panchas inform that damage has been caused to the forest in the applicable

to the Jetty as a result of the polluted chemical waste in the forest portion.

Thereafter, on heading forward, Birla Copper Unit having released polluted water in the Reserve Forest Compartment No. 596 area located besides the Power Plant, the trees located in this portion seems to have burnt. And as a result of water logging, due to the chemically poisoned water the insects therein have also died and therefore no living insects can be seen in the logged water. Looking to this area, the standing grown trees of "Ganda Baval" (Babul trees) in the 15 hectare area seems to have dried up and formidable damage have been caused, which is hereby declared by we, the Panchas.

Thereafter, on heading forward, going and seeing the Coal Depot area of Birla Copper unit, the heaps of Coal in the place of Reserve Forest Compartment No. 596 having spread, coal would be seen lying in this area, due to which damage can be seen to have been caused in the 10 meter wide and 42 meter long portion of the forest.

As a result of this coal, no vegetables, plant, tree or grass can be seen. In this way, it seems that damage has also been caused to this reserve jungle, which is hereby declared by we, the Panchas.

In this way, Birla Copper Unit has caused damage in the Reserve Forest Compartment No. 596 by dumping chemical waste, coal and by releasing chemical waste water thereby causing damage to the vegetables and lives of the forest. Such damage can be treated as irreparable and which cannot be compensated. If the waste coming out of the said company would not have been thrown / dumped in the reserve jungle then the forest that preserves the environment would have remained good and which is very much necessary for this area, which is hereby declared by we, the Panchas.

The said Panchkyas has been started at 12-45 hours and has been completed at 14-00 hours.

The above stated Panchkyas has been dictated and written by we, the Panchas, after carrying out personal inspection and on the same being read over to us, we have signed hereunder.

Signature of the Panchas

(1) Gohil Kalpeshbhai Amarsinh

(2) Gohil Kailashbhai Raisang

Before me
Sd/- Illegible
RFO
Bharuch
Sd/- A.S. Singha
Incharge R.F.O., Dahej

Sd/- Illegible
Dy. Manager
Birla Copper

Post : Bharuch

Date : 18/3/2007

My name is **Dr. P. R. Lange (Prabhakarrao Baburao Landge),** Aged 51 years, Occupation Service, General Manager, Quality & Environment, Hindalco Industries Limited, Unit Birla Copper, Residing at House No. C/5/1, Birla Copper Industries, Dahej, Native : 39, Saketnagar, Ujjain, Madhya Pradesh to-day on being called upon by you have appeared in person and do hereby record my statement on being asked by you the Range Forest Officer, Bharuch that :-

I am serving in the Birla Copper Unit of M/s. Hindalco Industries Limited since last ten years. At present, I am on the post of General Manager, Quality & Environment. My duty includes administration upon the quality of the products manufactured in the company and I am also responsible for looking after the raw materials brought in the company, finished products, waste material, effluent plant and to maintain the things manufactured in the company and store it at the right place and to also look after the issues related to environment. I am responsible for the administration of quality and environment in the entire factory of Birla Copper Unit.

Whatever material that is being left over after manufacturing of copper from the raw material in the Birla Copper Unit, which is termed as discarded slack, which is a black coloured granular material, which has been loaded the northern direction of the conveyor belt on the road leading to the Jetty. This material is being used for filling the land in place of sand and it is not being exported. We have dumped this material on the side of the Reserve Forest towards the northern direction of the Jetty. For this work, our company has granted contract, which has been given to transport company named Pavan Roadlines. I have shown the place to the contractor but by mistaken he has dumped the discarded slack in the reserve forest by coming out of the site of Birla Copper. There is no permanent boundary such as fencing, wall or gutter where I had asked the contractor to dump the discarded slack as a result of which he has mistakenly gone in the reserve forest land leaving the land of Birla Copper and heading ahead and has dumped the discarded slack, which I had came to know later on. Just like that near the coal depot also due to lack of knowledge by the contractor as a result of huge dumping in the reserve forest land and due to the spreading of the dump, certain more portion of the coal had gone into the reserve forest.

Near the Captive Power Plant of Birla Copper, the mud (sand) of the waste of the Plant has been dumped in the reserve forest land with the help of bull dozer, which has been dumped towards the reserve forest leaving the space where our new conveyor belt is to be installed / setup. The rain water which has came out of the company has flown into the reserve forest land, as a result of which the trees of the reserve forest land has dried up, things which comes under environment comes under my administration and management. Water also flows into the reserve forest from the hole in the wall of the captive power plant. In this way, by mistake or without adequate knowledge, damage has been caused to the reserve forest by the agency under my control, which fact is being admitted by me. This has happened due to lack of knowledge of the Contractor. To cause damage to the forest life by dumping chemical waste in the reserve forest and to cause damage to the forest life and vegetables by flowing polluted water in the land of the reserve forest amounts to an offence under Forest Law. I admit that this mistake has been committed unknowingly by the department which is under my control. I am ready and willing to undergo whatever punishment or penalty that may be given to us as a result of this offence and are ready to pay and bear the same on behalf of the company and I give consent to manage the same departmentally.

I promise to give full co-operation in the investigation for whenever and wherever the Government may call for me with regard to this offence and assure to remain present there.

My this statement has been got recorded by me without any intoxication and without any pressure, threat or coercion and in the present physical as well mental state of mind and body and I have signed hereunder after reading, got read and hearing the contents hereof.

Sd/- Illegible
18-09-07
(Dr. P. R. Landge)

Before me
Sd/- Illegible
RFO
Bharuch
18/09/07

Sd/- Illegible

Incharge R.F.O., Dahej.

Bail Bond to be procured in pursuance to procured in pursuance to Section 65 of Indian Forest Act

I, **Dr. PRABHAKHARRAO BABURAO LANGE,** resident of C-5/1, Birla Copper Township, Dahej, Taluka Vagra, District Bharuch being arrested under the powers of Section 64 of the Indian Forest Act, 1927, on being made to appear before you the Range Forest Officer, Bharuch under the offence of Forest for submitting my reply/statement, I hereby give confirmation that as and when I am required at that time I shall appear in person before the Honourable Range Forest Officer or Honourable First Class Magistrate. Or if I fail to do so, then I bind myself to pay Rs. 2,000/- Two Thousand only to the Honourable Government.

Place : Bharuch
Date : 18/9/07

Sd/- Illegible
18/09/07
(Signature of the Offender)

Sd/- Illegible
Range Forest Officer
Bharuch

I, **ASHOK NATWARLAL GANDHI,** resident of B/74, Amidhara Society, Nandelav Road, Beshav, Bharuch, Taluka Bharuch, District Bharuch do hereby give in writing that the above stated person who has been arrested under the offence shall appear before you the Range Forest Officer, Honourable First Class Magistrateas and when

required by you for giving his reply in the said matter. I confirm to remain as Guarantor for the same and if he would fail to appear then I bind myself to pay to the Honourable Government an amount of Rs. 2000/- Two Thousand Rupees.

Place : Bharuch
Date : 18/9/07

Sd/- Ashok Gandhi
Signature of the Guarantor

Sd/- Illegible
Range Forest Officer
Bharuch
Before me

Bail Bond to be procured in pursuance to procured in pursuance to Section 65 of Indian Forest Act

I, **NAVINKUMAR JAGDISHNARAYAN MATHUR,** resident of B/3/1, Birla Copper Township, Dahej, Taluka Vagra, District Bharuch being arrested under the powers of Section 64 of the Indian Forest Act, 1927, on being made to appear before you the Range Forest Officer, Bharuch under the offence of Forest for submitting my reply/statement, I hereby give confirmation that as and when I am required at that time I shall appear in person before the Honourable Range Forest Officer or Honourable First Class Magistrate. Or if I fail to do so, then I bind myself to pay Rs. 2,000/- Two Thousand only to the Honourable Government.

Place : Bharuch
Date : 18/9/07

Sd/- Illegible
18/09/07
(Signature of the Offender)

Sd/- Illegible
Range Forest Officer
Bharuch

I, **ASHOK NATWARLAL GANDHI,** resident of B/74, Amidhara Society, Nandelav Road, Beshav, Bharuch, Taluka Bharuch, District Bharuch do hereby give in writing that the above stated person who has been arrested under the offence shall appear before you the Range Forest Officer, Honourable First Class Magistrateas and when required by you for giving his reply in the said matter. I confirm to

remain as Guarantor for the same and if he would fail to appear then I bind myself to pay to the Honourable Government an amount of Rs. 2000/- Two Thousand Rupees.

Place : Bharuch
Date : 18/9/07

Sd/- Ashok Gandhi
Signature of the Guarantor

Sd/- Illegible
Range Forest Officer
Bharuch
Before me

REPLY

Post : Bharuch
Date : 18/9/07

My name is **NAVINKUMAR JAGDISHNARAYAN MATHUR,** Aged 53, Occupation Service, V.P. Commercial & Logistics, Hindalco Industries Limited, Unit - Birla Copper, Dahej, residing at : B-3/1, Birla Copper Township, Dahej, Native : Flat No. 505, Taivoli Apartments, 37, Wazir Hasan Road, Lucknow, Uttar Pradesh do hereby give my reply/statement on being asked and on being called by you Range Forest Officer, Bharuch and by appearing in person.

I am serving in Hindalco Industries Limited Unit : Birla Copper, Dahej since last five years. I am on the post of Vice President, Commercial & Logistics in the Birla Copper Unit. In my job I carry out administration / management of By-product selling, Export, Raw Material Import and Customs & Excise.

Whatever residue that is being left over after manufacturing of copper from the raw-material in the Birla Copper Unit, the same is being exported by us. This material is termed as discarded slack, which is black coloured granual material. The same has been dumped by us near the reserve forest near the conveyor belt on the road leading towards Jetty. The same is on the northern direction from the road leading towards Jetty. This work has been allocated to Pavan Roadlines. I have shown to the contractor the place of our Birla Copper unit for dumping this discarded slack, but unknowingly and mistakenly this discarded slack has been dumped in the land of reserve forest. A board of reserve forest has been installed at this place but due to lack of knowledge by the Driver, this material has mistakenly been dumped in the reserve forest, which I had came to know later on. This mistake has happened unknowingly. We have not dumped this slack intentionally.

It is an offence to cause damage to the reserve forest land by dumping the chemical waste. I admit that this offence has been committed unknowingly and by mistake.

I promise to give full co-operation in the investigation for whenever and wherever the Government may call for me with regard to this offence and assure to remain present there.

My this statement has been got recorded by me without any intoxication and without any pressure, threat or coercion and in the present physical as well mental state of mind and body and I have signed hereunder after reading, got read and hearing the contents hereof.

Sd/- Illegible
18-09-07
(Navin Kumar)

Before me
Sd/- Illegible
RFO
Bharuch
18/09/07

Sd/- Illegible
Incharge R.F.O., Dahej.

REPLY

Post : Bharuch

Date : 18/9/2007

My name is **ANILKUMAR SHARDASWAROOP KULSHRESTH,** Aged 58 years, Occupation Service - Hindalco Industries Limited, Unit Birla Copper, residing at B-5/1, Birla Copper Township, Dahej, Native : Daru, Adarshnagar, Ajmer, to-day on Date : 18/9/2007 on being called by you, appear in person and record my reply / statement that :

I am serving Birla Copper Unit of Hindalco Industries Limited since last 11 months. I am on the post of Vice President, Projects (Civil). Whatever Civil works that is being carried out in Birla Copper Industries, the same is being administered and managed by me. My work is to set up project and my work is within the plant area.

On the coal depot of the Birla Copper Unit, Pipe conveyor is being prepared for carrying the coal imported from outside from the Jetty. This construction is being carried out by company named Ravi Construction, which is in the work of Civil Construction. The construction work for setting up / installing conveyor belt near the captive power plant is going on. Where the Contractor has mistakenly and unknowingly pushed the chemical waste mud/sand in the reserve jungle with the help of Bulldozer. I am carrying out inspection work of this pipe conveyor. And as a result of hole being made in the wall at this place, the chemical rain water which had collected there has gone / flown into the reserve forest. I had later on come to know about the chemical sand near the conveyor which has been mistakenly dumped in the reserve jungle. The Contractor has not done this work intentionally. I admit that this has happened mistakenly due to overseeing of the boundary of the reserve jungle.

Dumping of chemical waste mud/sand in the land of reserve forest and causing damage to the land of the reserve forest amounts to offence. I admit that this offence has been committed mistakenly and unknowingly by the contractor and it has not been done intentionally. As a result of this offence, whatever punishment, penalty that would be imposed, we are ready and willing to bear and pay the same on behalf of the company and I give my consent to undergo departmental proceedings.

I promise to give full co-operation in the investigation for whenever and wherever the Government may call for me with regard to this offence and assure to remain present there.

My this statement has been got recorded by me without any intoxication and without any pressure, threat or coercion and in the present physical as well mental state of mind and body and I have signed hereunder after reading, got read and hearing the contents hereof.

Sd/- Illegible
18-09-07

Before me
Sd/- Illegible
RFO
Bharuch
18/09/07

Sd/- Illegible
Incharge R.F.O., Dahej.

Bail Bond to be procured in pursuance to procured in pursuance to Section 65 of Indian Forest Act

I, **ANILKUMAR SHARDASWAROOP KULSHRESTH,** resident of B/5/1, Birla Copper Township, Dahej, Taluka Vagra, District Bharuch being arrested under the powers of Section 64 of the Indian Forest Act, 1927, on being made to appear before you the Range Forest Officer, Bharuch under the offence of Forest for submitting my reply/statement, I hereby give confirmation that as and when I am required at that time I shall appear in person before the Honourable Range Forest Officer or Honourable First Class Magistrate. Or if I fail to do so, then I bind myself to pay Rs. 2,000/- Two Thousand only to the Honourable Government.

Place : Bharuch
Date : 18/9/07

Sd/- Illegible
18/09/07
(Signature of the Offender)

Sd/- Illegible
Range Forest Officer
Bharuch

I, **ASHOK NATWARLAL GANDHI,** resident of B/74, Amidhara Society, Nandelav Road, Beshav, Bharuch, Taluka Bharuch, District Bharuch do hereby give in writing that the above stated person who has been arrested under the offence shall appear before you the Range Forest Officer, Honourable First Class Magistrate as and when

required by you for giving his reply in the said matter. I confirm to remain as Guarantor for the same and if he would fail to appear then I bind myself to pay to the Honourable Government an amount of Rs. 2000/- Two Thousand Rupees.

Place : Bharuch
Date : 18/9/07

Sd/- Ashok Gandhi
Signature of the Guarantor

Sd/- Illegible
Range Forest Officer
Bharuch
Before me

1584

ADITYA BIRLA

HINDALCO

HINDALCO INDUSTRIES LIMITED

(UNIT : BIRLA COPPER)
P.O. DAHEJ, DIST. BHARUCH (GUJARAT), PIN 392 130
Phone : (02641) 256004-6, 9 Fax (02641) 256002-3

INVOICE CUM DELIVERY CHALLAN

(U/R 4, 8 & 11 of Central Excise Rule 2002)
AN ISO 9001 & 14001 COMPANY

TRIPLICATE FOR ASSESSEE

Authenticated
Hindalco Industries Ltd.
(Unit Birla Copper)
Authorised Signatory

TAX INVOICE

Customer's Name & Address

7011 - STERLING PORT LTD.
DAHEJ PORT,
TALUKA: VAGRA,DIST. BHARUCH
DAHEJ-390130 (GUJARAT) - INDIA

Consignee's Name & Address

7360 - STERLING PORT LTD
DAHEJ PORT,
TALUKA: VAGRA,
DIST. BHARUCH
DAHEJ-392130 (GUJARAT) - INDIA

CUSTOMER'S / CONSIGNEE'S DETAILS FOR AVAILING CENVAT CREDIT

E.C.C. No. :
Excise Registration No. :
Range :
Division :
Commissionerate :
Income Tax No. :
CST Number :
State S.T.Number :
Supplier Code :
Customer TIN :
Consignee TIN : 24210700271 24210700271

Invoice No. & Date: **AW/11016052** AW/11016052 11/05/2011
Type of Sale: Within State
Delivery Order No.: GDNCSL/11081000047-1
Purchase Order No.:

Name of Transporter	Mode of Transporter	L/R/RR No. & Date	Vehicle No.
ANJANI EXCAVATION OPERATION	Road	084660 11/05/2011	RJ21GA1764

Name of Excise Commodity / Product Description / HSN Code	Tariff Sub-heading	Notification No. & Date	Date & Time of Issue of Invoice	Date & Time of Removal
COPPER SLAG A	2621 90 00	NOT APPLICABLE	11/05/2011 14:50	11/05/2011

Identification Number	UNIT	Quantity	Rate Per Unit (Rs.)	Additions / Deductions U/S4 (Rs)	Assessable Value in Rs. Per Unit	Total
COPPER SLAG 2621 90 00	MT	19.900				
	TOTAL	19.900	35		35	697
					Excise Duty @ 10%	70
					Education Cess @ 2% On Excise	1
					S & H Education Cess @ 1% On Excise	1
					Vat @ 4%	31
					Additional Vat @ 1%	8
					GRAND TOTAL :	807

Rs.in Words :
EIGHT HUNDRED SEVEN ONLY

ED. & Cess : 10.3% on Rs. : 697
LC No :
Rs. in words
Party Banker SEVENTY TWO ONLY

Payment Terms IMMEDIATE

PAN : AAACH1201R
Excise Registration No. : AAACH1201RXM003
Range : IV, Central Excise & Customs, IInd Floor, C.E. Building, Bharuch.
Division : Central Excise & Customs, 1st Floor, C.E. Building, Bharuch
Commissionerate : Central Excise & Customs, Vadodara II.
PLA No. : AAACH1201RXM003 ECC NO.: AAACH1201RXM003

Delivery ID : 118153

CST REG. NO.: 24710700069 W.E.F. 15.04.1995
VAT REG. NO.: 24210700069 W.E.F. 01.07.2002

Certified that the particular given are true and correct and the amount indicated the represents the price actually charged & that there is no flow of additional consideration directly or indirectly from buyer.

"Our Delivery Challan/Invoice weight is final. Weight difference up to +/- 0.2% will not be accepted under standard weight tolerance norm."

Other Conditions
(i) Interest @ 24% shall be charged if payment not made on due date.
(Ii) Business transaction Subject to the Jurisdiction of Mumbai Court.

MARKETING OFFICE : **ADITYA BIRLA CENTRE, 1st Floor, D WING, S.K. AHIRE MARG, WORLI, Mumbai 400 030 PHONE (022) 56525000 FAX (022) 56525211**
REGD. OFFICE : Hindalco Industries Limited, 3rd Floor, Century Bhavan, Dr. Annie Besant Road, Mumbai 400 025, INDIA. TEL.: 022-56626666 FAX : 022-24227586

For HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)

AUTHORISED SIGNATORY

ADITYA BIRLA

HINDALCO

HINDALCO INDUSTRIES LIMITED

(UNIT : BIRLA COPPER)
P.O. DAHEJ, DIST. BHARUCH (GUJARAT), PIN 392 130
Phone : (02641) 256004-6, 9 Fax (02641) 256002-3

INVOICE CUM DELIVERY CHALLAN

(U/R 4, 8 & 11 of Central Excise Rule 2002)
AN ISO 9001 & 14001 COMPANY
TAX INVOICE

TRIPLICATE FOR ASSESSEE

1585

Authenticated
Hindalco Industries Ltd.
(Unit Birla Copper)
Authorised Signatory

Customer's Name & Address
7011 - STERLING PORT LTD.
DAHEJ PORT,
TALUKA: VAGRA,DIST. BHARUCH
DAHEJ-390130 (GUJARAT) - INDIA

Consignee's Name & Address
7360 - STERLING PORT LTD
DAHEJ PORT,
TALUKA: VAGRA,
DIST. BHARUCH
DAHEJ-392130 (GUJARAT) - INDIA

AW/11025676

CUSTOMER'S / CONSIGNEE'S DETAILS FOR AVAILING CENVAT CREDIT

E.C.C. No. :
Excise Registration No. :
Range :
Division :
Commissionerate :

Income Tax No. :
CST Number :
State S.T.Number :
Supplier Code :
Customer TIN 24210700271
Consignee TIN 24210700271

Invoice No. & Date AW/11025676 31/05/2011
Type of Sale Within State
Delivery Order No. BDNCSL/11081000004-1
Purchase Order No.

Name of Transporter	Mode of Transporter	L/R/RR No. & Date	Vehicle No.
ANJANI EXCAVATION OPERATION	Road	082767 31/05/2011	RJ21GA1971

Name of Excise Commodity	Tariff Sub-heading	Notification No. & Date	Date & Time of Issue of Invoice	Date & Time of Removal
COPPER SLAG-A	2621 90 00	NOT APPLICABLE	31/05/2011 14:28	31/05/2011

14129

Product Description / HSN Code	Identification Number	UNIT	Quantity	Rate Per Unit (Rs.)	Additions/ Deductions U/S4 (Rs)	Assessable Value in Rs. Per Unit	Assessable Value in Rs. Total
COPPER SLAG 2621 90 00		MT	19.210				
		TOTAL :	19.210	35		35	672
						Excise Duty @ 10%	67
						Education Cess @ 2% On Excise	1
						S & H Education Cess @ 1% On Excise	1
						Vat @ 4%	30
						Additional Vat @ 1%	7
						GRAND TOTAL :	779

Rs.in Wor SEVEN HUNDRED SEVENTY NINE ONLY

ED. & Cess 10.3% on Rs. 672 : Rs. in words SIXTY NINE ONLY
LC No :
Payment Terms IMMEDIATE
Party Banker

Delivery ID : 131919

PAN : AAACH1201R
Excise Registration No. : AAACH1201RXM003
Range : IV, Central Excise & Customs, IInd Floor, C.E. Building, Bharuch.
Division : Central Excise & Customs, 1st Floor, C.E. Building, Bharuch
Commissionerate : Central Excise & Customs, Vadodara II.
PLA No. : AAACH1201RXM003 ECC NO.: AAACH1201RXM003

CST REG. NO.: 24710700069 W.E.F. 15.04.1995
VAT REG. NO.: 24210700069 W.E.F. 01.07.2002

Certified that the particular given are true and correct and the amount indicated the represents the price actually charged & that there is no flow of additional consideration directly or indirectly from buyer.

"Our Delivery Challan/Invoice weight is final. Weight difference up to +/- 0.2% will not be accepted under standard weight tolerance norm."

Other Conditions
(i) Interest @ 24% shall be charged if payment not made on due date.
(ii) Business transaction Subject to the Jurisdiction of Mumbai Court.

MARKETING OFFICE : ADITYA BIRLA CENTRE, 1st Floor, D WING, S.K. AHIRE MARG, WORLI, Mumbai 400 030 PHONE (022) 56525000 FAX (022) 56525211
REGD. OFFICE : Hindalco Industries Limited, 3rd Floor, Century Bhavan, Dr. Annie Besant Road, Mumbai 400 025, INDIA. TEL.: 022-56626666 FAX : 022-24227586

For HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)
AUTHORISED SIGNATORY

ADITYA BIRLA

HINDALCO

HINDALCO INDUSTRIES LIMITED

(UNIT : BIRLA COPPER)
P.O. DAHEJ, DIST. BHARUCH (GUJARAT), PIN 392 130
Phone : (02641) 256004-6, 9 Fax (02641) 256002-3

INVOICE CUM DELIVERY CHALLAN

(U/R 4, 8 & 11 of Central Excise Rule 2002)
AN ISO 9001 & 14001 COMPANY

TAX INVOICE

TRIPLICATE FOR ASSESSEE

Authenticated
Hindalco Industries Ltd.
(Unit Birla Copper)
Authorised Signatory

Customer's Name & Address

7011 - STERLING PORT LTD.
DAHEJ PORT,
TALUKA: VAGRA,DIST. BHARUCH
DAHEJ-390130 (GUJARAT) - INDIA

Consignee's Name & Address

7360 - STERLING PORT LTD
DAHEJ PORT,
TALUKA: VAGRA,
DIST. BHARUCH
DAHEJ-392130 (GUJARAT) - INDIA

CUSTOMER'S / CONSIGNEE'S DETAILS FOR AVAILING CENVAT CREDIT

AW/11029663

E.C.C. No. :
Excise Registration No. :
Range :
Division :
Commissionerate :

Income Tax No. :
CST Number :
State S.T.Number :
Supplier Code :
Customer TIN : 24210700271
Consignee TIN : 24210700271

Invoice No. & Date : AW/11029663 10/06/2011
Type of Sale : Within State
Delivery Order No. : BDNCSL/11081000073-1
Purchase Order No. :

Name of Transporter	Mode of Transporter	L/R/RR No. & Date	Vehicle No.
ANJANI EXCAVATION OPERATION	Road	19842 10/06/2011	RJ15GA0415

Name of Excise Commodity	Tariff Sub-heading	Notification No. & Date	Date & Time of Issue of Invoice	Date & Time of Removal
COPPER SLAG-A	2621 90 00	NOT APPLICABLE	10/06/2011 02:28	10/06/2011

Product Description / HSN Code	Identification Number	UNIT	Quantity	Rate Per Unit (Rs.)	Additions/ Deductions U/S4 (Rs)	Assessable Value in Rs. Per Unit	Assessable Value in Rs. Total
COPPER SLAG 2621 90 00		MT	17.360				
		TOTAL :	17.360	35	35		608
					Excise Duty @ 10%		61
					Education Cess @ 2% On Excise		1
					S & H Education Cess @ 1% On Excise		1
					Vat @ 4%		27
					Additional Vat @ 1%		7
					GRAND TOTAL :		704

Rs.in Words : SEVEN HUNDRED FOUR ONLY

ED. & Cess : 10.3% on Rs. : 608 Rs. in words : SIXTY THREE ONLY
LC No : Party Banker
Payment Terms IMMEDIATE

PAN : AAACH1201R
Excise Registration No. : AAACH1201RXM003 **Delivery ID : 138360**
Range : IV, Central Excise & Customs, IInd Floor, C.E. Building, Bharuch.
Division : Central Excise & Customs, 1st Floor, C.E. Building, Bharuch
Commissionerate : Central Excise & Customs, Vadodara II.
PLA No. : AAACH1201RXM003 ECC NO.: AAACH1201RXM003

CST REG. NO.: 24710700069 W.E.F. 15.04.1995
VAT REG. NO.: 24210700069 W.E.F. 01.07.2002

Certified that the particular given are true and correct and the amount indicated the represents the price actually charged & that there is no flow of additional consideration directly or indirectly from buyer.

"Our Delivery Challan/Invoice weight is final. Weight difference up to +/- 0.2% will not be accepted under standard weight tolerance norm."

Other Conditions
(i) Interest @ 24% shall be charged if payment not made on due date.
(ii) Business transaction Subject to the Jurisdiction of Mumbai Court.

MARKETING OFFICE : ADITYA BIRLA CENTRE, 1st Floor, D WING, S.K. AHIRE MARG, WORLI, Mumbai 400 030 PHONE (022) 56525000 FAX (022) 56525211
REGD. OFFICE : Hindalco Industries Limited, 3rd Floor, Century Bhavan, Dr. Annie Besant Road, Mumbai 400 025, INDIA. TEL.: 022-56626666 FAX : 022-24227586

For HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)
AUTHORISED SIGNATORY

1587

ADITYA BIRLA
HINDALCO

HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)
P.O. DAHEJ, DIST. BHARUCH (GUJARAT), PIN 392 130
Phone : (02641) 256004-6, 9 Fax (02641) 256002-3

INVOICE CUM DELIVERY CHALLAN
(U/R 4, 8 & 11 of Central Excise Rule 2002)
AN ISO 9001 & 14001 COMPANY

TRIPLICATE FOR ASSESSEE

Authenticated
Hindalco Industries Ltd.
(Unit Birla Copper)
Authorised Signatory

TAX INVOICE

Customer's Name & Address

7011 - STERLING PORT LTD.
DAHEJ PORT,
TALUKA: VAGRA,DIST. BHARUCH
DAHEJ-390130 (GUJARAT) - INDIA

Consignee's Name & Address

7360 - STERLING PORT LTD
DAHEJ PORT,
TALUKA: VAGRA,
DIST. BHARUCH
DAHEJ-392130 (GUJARAT) - INDIA

CUSTOMER'S / CONSIGNEE'S DETAILS FOR AVAILING CENVAT CREDIT

AW/11029688

E.C.C. No.		Income Tax No.		Invoice No. & Date	AW/11029688 10/06/2011
Excise Registration No.		CST Number			
Range		State S.T.Number		Type of Sale	Within State
Division		Supplier Code		Delivery Order No.	BDNCSL/11081000073-1
Commissionerate		Customer TIN	24210700271	Purchase Order No.	
		Consignee TIN	24210700271		

Name of Transporter	Mode of Transporter	L/R/RR No. & Date	Vehicle No.
ANJANI EXCAVATION OPERATION	Road	19659 10/06/2011	RJ19GB4117

Name of Excise Commodity	Tariff Sub-heading	Notification No. & Date	Date & Time of Issue of Invoice	Date & Time of Removal
COPPER SLAG-A	2621 90 00	NOT APPLICABLE	10/06/2011 05:13	10/06/2011

Product Description HSN Code	Identification Number	UNIT	Quantity	Rate Per Unit (Rs.)	Additions/ Deductions U/S4 (Rs)	Assessable Value in Rs. Per Unit	Total
COPPER SLAG 2621 90 00		MT	19.030				
		TOTAL :	19.030	35		35	666
					Excise Duty @ 10%		67
					Education Cess @ 2% On Excise		1
					S & H Education Cess @ 1% On Excise		1
					Vat @ 4%		29
					Additional Vat @ 1%		7
					GRAND TOTAL :		771

Rs.in Words : SEVEN HUNDRED SEVENTY ONE ONLY

ED. & Cess : 10.3%on Rs. : 666 Rs. in words SIXTY NINE ONLY
LC No : Party Banker
Payment Terms IMMEDIATE

PAN : AAACH1201R
Excise Registration No. : AAACH1201RXM003 **Delivery ID : 138407**
Range : IV, Central Excise & Customs, IInd Floor, C.E. Building, Bharuch.
Division : Central Excise & Customs, 1st Floor, C.E. Building, Bharuch
Commissionerate : Central Excise & Customs, Vadodara II.
PLA No. : AAACH1201RXM003 ECC NO.: AAACH1201RXM003

CST REG. NO.: 24710700069 W.E.F. 15.04.1995
VAT REG. NO.: 24210700069 W.E.F. 01.07.2002

Certified that the particular given are true and correct and the amount indicated the represents the price actually charged & that there is no flow of additional consideration directly or indirectly from buyer.

"Our Delivery Challan/Invoice weight is final. Weight difference up to +/- 0.2% will not be accepted under standard weight tolerance norm."

Other Conditions
(i) Interest @ 24% shall be charged if payment not made on due date.
(ii) Business transaction Subject to the Jurisdiction of Mumbai Court.

MARKETING OFFICE : ADITYA BIRLA CENTRE, 1st Floor, D WING, S.K. AHIRE MARG, WORLI, Mumbai 400 030 PHONE (022) 56525000 FAX (022) 56525211
REGD. OFFICE : Hindalco Industries Limited, 3rd Floor, Century Bhavan, Dr. Annie Besant Road, Mumbai 400 025, INDIA. TEL.: 022-56626666 FAX : 022-24227586

For HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)
AUTHORISED SIGNATORY

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ADITYA BIRLA

HINDALCO

HINDALCO INDUSTRIES LIMITED

(UNIT : BIRLA COPPER)
P.O. DAHEJ, DIST. BHARUCH (GUJARAT), PIN 392 130
Phone : (02641) 256004-6, 9 Fax (02641) 256002-3

INVOICE CUM DELIVERY CHALLAN
(U/R 4, 8 & 11 of Central Excise Rule 2002)
AN ISO 9001 & 14001 COMPANY

TRIPLICATE FOR ASSESSEE

Authenticated
Hindalco Industries Ltd.
(Unit Birla Copper)
Authorised Signatory

TAX INVOICE

Customer's Name & Address

7011 - STERLING PORT LTD.
DAHEJ PORT,
TALUKA: VAGRA,DIST. BHARUCH
DAHEJ-390130 (GUJARAT) - INDIA

Consignee's Name & Address

7360 - STERLING PORT LTD
DAHEJ PORT,
TALUKA: VAGRA,
DIST. BHARUCH
DAHEJ-392130 (GUJARAT) - INDIA

CUSTOMER'S / CONSIGNEE'S DETAILS FOR AVAILING CENVAT CREDIT

E.C.C. No. :
Excise Registration No. :
Range :
Division :
Commissionerate :

Income Tax No. :
CST Number :
State S.T.Number :
Supplier Code :
Customer TIN :
Consignee TIN : 24210700271 24210700271

Invoice No. & Date : **AW/11029670** AW/11029670 10/06/2011
Type of Sale : Within State
Delivery Order No. : BDNC6L/11081000073-1
Purchase Order No. :

Name of Transporter	Mode of Transporter	L/R/RR No. & Date	Vehicle No.
ANJANI EXCAVATION OPERATION	Road	19041 10/06/2011	RJ19GB4117

Name of Excise Commodity	Tariff Sub-heading	Notification No. & Date	Date & Time of Issue of Invoice	Date & Time of Removal
COPPER SLAG-A	2621 90 00	NOT APPLICABLE	10/06/2011 03:05	10/06/2011 03:07

Product Description / HSN Code	Identification Number	UNIT	Quantity	Rate Per Unit (Rs.)	Additions/ Deductions U/S4 (Rs)	Assessable Value in Rs. Per Unit	Total
COPPER SLAG 2621 90 00		MT	16.810				
		TOTAL :	16.810		35	35	588
						Excise Duty @ 10%	59
						Education Cess @ 2% On Excise	1
						S & H Education Cess @ 1% On Excise	1
						Vat @ 4%	26
						Additional Vat @ 1%	6
						GRAND TOTAL :	681

Rs.in Words :
SIX HUNDRED EIGHTY ONE ONLY

ED. & Cess : on Rs. : 10.3% : 588
LC No :
Rs. in words : SIXTY ONE ONLY
Party Banker :

Payment Terms : IMMEDIATE

PAN : AAACH1201R
Excise Registration No. : AAACH1201RXM003
Range : IV, Central Excise & Customs, IInd Floor, C.E. Building, Bharuch.
Division : Central Excise & Customs, 1st Floor, C.E. Building, Bharuch
Commissionerate : Central Excise & Customs, Vadodara II.
PLA No. : AAACH1201RXM003 ECC NO.: AAACH1201RXM003

Delivery ID : 138368

CST REG. NO.: 24710700069 W.E.F. 15.04.1995
VAT REG. NO.: 24210700069 W.E.F. 01.07.2002

Certified that the particular given are true and correct and the amount indicated the represents the price actually charged & that there is no flow of additional consideration directly or indirectly from buyer.

"Our Delivery Challan/Invoice weight is final. Weight difference up to +/- 0.2% will not be accepted under standard weight tolerance norm."

Other Conditions
(i) Interest @ 24% shall be charged if payment not made on due date.
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MARKETING OFFICE : ADITYA BIRLA CENTRE, 1st Floor, D WING, S.K. AHIRE MARG, WORLI, Mumbai 400 030 PHONE (022) 56525000 FAX (022) 56525211
REGD. OFFICE : Hindalco Industries Limited, 3rd Floor, Century Bhavan, Dr. Annie Besant Road, Mumbai 400 025, INDIA. TEL.: 022-56626666 FAX : 022-24227586

For HINDALCO INDUSTRIES LIMITED
(UNIT : BIRLA COPPER)
AUTHORISED SIGNATORY

DAMAGE COST ASSESSMENT DUE TO SOIL POLLUTION
Caused on Account of Copper Slag Dumping by
M/S HINDALCO INDUSTRIES LIMITED,
DAHEJ, BHARUCH, GUJARAT
IN THE MATTER OF OA NO. 70/2021 (WZ)

Introduction

Details of Court matter and request to NEERI for DCA

Methodology

In order to calculate the external costs of pollution due to the activities carried out in the past, an impact pathway analysis (IPA) approach is adopted. The impacts are assessed by monitoring the pollutant's emissions or contamination to the media on the passage or the receptor where the damages are expected and economically evaluating the damages through the identified impacts.

In this study, the land environment damages are taken in account by the impact pathway analysis. For this, the soil sampling for different chemical species was carried out in the dumping area where the copper slag was dumped. During field survey it is realized that the area where slag was dumped, is a low lying area and the surface run-off during rain accumulates in this region. In a first look, the clean-up measure would be to remove the top soil and create a depression that would allow rain water to accumulate, which can be used by the local fauna in the vicinity. As per the records, the area along the boundary wall for a distance of about 150 m and a width of 100 m was used for slag dumping. However, as a precautionary measure, the area from boundary wall up to the dry patch, where water is accumulated during rain is considered impacted. If the identified patch is cleaned, the area can be considered to be fully cleared of old dump and its impact. The identified area from the Google map is shown in **Fig. 1**.

The soil sampling for the chemical species determination, specifically metals was carried out at 9 locations in the alleged slag dumping area. One sample was collected far away (native soil near Bhutnath Temple) from the dumping area so as to establish the control site. The soil samples were collected at top and at the depth of 0.5 m.

Fig. 1: Likely contaminated area near the boundary wall of plant.

Environmental Externalities Valuation

Soil contaminated due to the emissions from the slag dumping may impose risk to surroundings (animals, plants etc.). The soil contamination or drivers of the impact are usually heavy metals and other chemical species in the soil and water that can showcase the impacts. As per literature, the contamination has been considered in terms of leachate discharge in many studies (ExternE, 1995). The impacts are identified based on the violation of the standards (Dutch standards) of soil quality parameters. Another way for Indian site can be by considering the soil contamination in terms of metals concentration more than the native soil of the region. In this analysis, the impacts are quantified by measuring the difference in metal concentration between dumping area and native soil. **Table 1** shows the concentration of elements in native soil and in the slag dumping area.

Table 1: Element concentration (mg/kg) in Soil.

Element	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B
As	0.32	0.25	2.88	3	15.26	15.6	1.34	1.36	0.92	0.95
Cu	9.86	10.08	188.12	194.94	449.93	462	258.36	259.93	43.02	45.27
Cr	0.63	0.62	0.64	0.65	0.82	0.87	0.55	0.59	0.47	0.58
Cd	0.05	0.03	1.45	1.54	4.13	4.19	0.81	0.81	0.35	0.4
Ni	0.49	0.47	0.85	0.84	1.3	1.27	1.03	1.01	0.46	0.48
Zn	1.73	1.74	17.01	17.99	31.74	32	16.37	16.63	3.91	5.11
Pb	0.29	0.26	2.3	2.02	7.32	7.08	1.36	1.36	0.69	0.68
Mo	0.14	0.04	0.65	0.62	3.93	3.71	0.79	0.75	0.14	0.17
Mn	5.32	5.38	4.74	4.73	6.94	7.01	2.87	2.9	4.68	4.7

Element	6A	6B	7A	7B	8A	8B	9A	9B	10A	10B
As	1.65	1.63	10.75	11.28	6.97	7.21	12.4	12.64	0.61	0.63
Cu	122.91	122.34	62.66	64.97	110.18	112	470.24	466.23	67.89	72.08
Cr	0.5	0.51	2.24	2.47	1.89	2.08	0.89	0.93	0.54	0.6
Cd	1.29	1.27	0.33	0.36	0.37	0.4	3.77	3.79	0.81	0.88
Ni	0.86	0.83	0.22	0.2	0.21	0.22	1.27	1.25	0.78	0.81
Zn	11.56	11.42	90.25	93.53	122.41	126	28.81	28.86	10.18	10.88
Pb	1.51	1.44	4.31	4.27	4.13	4.05	7.72	7.49	0.61	0.63
Mo	0.38	0.35	11.24	11.2	5.87	5.96	2.94	2.88	0.23	0.22
Mn	4.12	4.04	2.8	2.82	3.26	3.33	5.76	5.75	4.06	4.32

Note: *Sample 1A and 1B is from Native soil. Remaining samples are from contaminated site.*

Cost Estimation

To monetize the impacts, the assignment of the cost is determined by control cost methodology as provided in Extern E (2005) is adopted. The pollutants released in to the media are assigned the cost of per pollutant damage. To assign the cost of per pollutant damage, Benefits (or costs) transfer valuation method is employed (OECD, 1995). The environmental pricing values as specified in Bruyn et al. (2018) are used for each metal in soil. The damage costs due to each pollutant are mentioned in **Table 2**. The costs are assigned to the average of all the locations and projected to entire dumping area as mentioned in **Table 2**.

To determine, whether the slag dump area is contaminated or not, the elements from the slag dump area is compared with native soil. To be on safer side, the minimum of two values of native soil is considered as representative of native soil. For determining the concentration in slag dump area, among the 9 sampling locations (18 analysis results), the maximum value for each element is chosen for comparison and cost estimation.

An area of 7061 m^2 with a depth of 1.0 m is considered to be cleaned and therefore volume of soil to be removed is 7061 m^3. The density of soil is considered as 1602.80 kg/m^3. This brings total weight of soil as 11317370.80 Kg. Total metal in the soil to be cleaned is estimated in Kg. The environmental cost for each element in Euro per Kg of that metal is determined from Dutch reference. There are three values prescribed for each element. Lower value, central value and upper value costs. In order to account for variation in concentration in an area of 7061 m2, the central value is considered for cost estimation. The Euro values are converted to Indian Rupees, followed by total cost for each metal for the year 2015 as the estimated were prepared for 2015 by CE Delft (Environment Price Hand Book 2017). Considering an inflation of 2.7 from 2015 to 2022 in India, the cost is adjusted for the inflation and is calculated for 2022.

Based on this methodology, the total environment damage cost comes out to be Rs. 2,47,79,292.00.

Table 2: Environmental Cost due to soil damage.

Element	Native Soil (mg/kg)	Dump site (mg/kg)	Metal in Soil (kg)	Env. Cost (Euro per kg)	Env. Cost (Rs. per kg)	Cost (Rs.) in 2015	Cost (Rs.) in 2022
Cu	9.86	470.24	5321.88	0.239	19.12	101754	274737
Cr	0.62	2.47	27.95	0.000636	0.05088	1	4
Cd	0.03	4.19	47.42	2040	163200	7738909	20895053
Ni	0.47	1.3	14.71	0.342	27.36	403	1087
Zn	1.73	125.82	1423.95	8.78	702.4	1000184	2700496
Pb	0.26	7.72	87.37	14.2	1136	99252	267982
Mo	0.04	11.24	127.21	22.7	1816	231008	623723
Mn	5.32	7.01	79.33	0.946	75.68	6004	16211
						Total	**24779292**

The following assumptions and/or estimates are considered for the damage cost estimation.

1. The dumping volume is estimated using Google Earth Imagery. The area of the dumping ground is estimated to be 7061 m^2. The depth of the dump is considered to be 1 meter.
2. 1 m^3 of soil weighs about 1602.8 Kg (WikiAnswers:http://wiki.answers.com/Q/How_much_does ... oil_weight).
3. The environmental pricing for pollutants is available for Netherlands. The appropriate exchange rates and inflation rates (https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=CN-AE) are used to adjust the benefit transfer method.
4. As mentioned earlier, the impacts are identified based on the violation of the standard limit of soil quality parameters and by comparing with the metals in the native soil. If any of the violations either comparing with the Dutch standards or with the values observed for native soil are observed, they are considered as the impacts due to the plant operations and dumping.

5. The presence of metals in the soil of the dumping ground may in-filtrate in to the ground water or the surface water may also get contaminated. The rainwater may cause leachate discharge in the area and water bodies may get contaminated.
6. The leachate may discharge into surface and ground water. It was however observed that surface and ground water damage cost was almost negligible and therefore not considered in the study.
7. Higher loading of metals may impose the sever threat to environment and may reside for longer duration and therefore environmental externalities are computed.

References

ExternE (1995). Externalities of Energy – METHODOLOGY. Prepared by Etsu, UK, and Metroeconomica, UK. EUR 16521 El. Published by the EUROPEAN COMMISSION Directorate-General XII Science, Research and Development, L - 2920 Luxembourg.

- ExternE (2005). Externalities of Energy Methodology 2005 Update. Edited by Peter Bickel and Rainer Friedrich Institut für Energiewirtschaft und Rationelle Energieanwendung — IER Universität Stuttgart, Germany.
- Bruyn, S., Ahdour, S., Bijleveld, M., Graaff, L.De, Schep, E., Schroten, A., Vergeer, R. (2018). Environmental Prices Handbook (2017). Methods and numbers for valuation of environmental impacts. Delft, CE Delft. Publication code: 18.7N54.057.
- European Commission (2000), DG Environment. A Study on the Economic Valuation of Environmental Externalities from Landfill Disposal and Incineration of Waste. Final Main Report. October 2000.
- OECD (1995). OECD Environment Directorate Environment Policy Committee (April 1995): Environmental Project and Policy Appraisal: A Manual for Policy Analysts.

Inspection & Action taken Chronological detail for M/s Hindalco Industries Ltd since January 2017

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
2017							
1	**08/11/2016**	letter submitted by Party regarding Direction under Section-5 of the EP Act-1986 regarding Installation of on line effluent and emission monitoring system		• Storm water drains in the premises are utilized as a highly acidic industrial wastewater carrying drains. This wastewater stream is mainly coming from HF -602 scrubber of Phosphoric acid plant (PAP Plant). Storm water drains is not having acid proof brick lining and also found damaged at various points which may result in seepage of acidic wastewater into underground strata. • Minor quantity of highly acidic wastewater is also observed being accumulated in storm water drain adjacent to compound wall of Phospho gypsum waste storage yard. • Highly acidic wastewater generated from PAP Plant is partially circulated in cooling tower of PAP Plant which resulting into dispersion/spreading of acidic droplets and acidic fumes into the atmosphere. Eye and nose irritation is felt due to acidic fumes emission.	Issued NOD under section 33-A of the Water Act - 1974 on 11/01/2017	• It was informed that the observations are of localized issues and momentary in nature and the company has taken up of required corrective measures immediately. • Same has been intimated in the reply letter submitted by the unit on **11.11.2016**. • The NOD dated 11/01/2017 has been replied with reference to reply letter dated 11.11.2016.	04

Annexure-12

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• Accumulated water in storm water drain leading from PAP plant shows pH: 0.86 and fluoride -149 mg/l which is very high • Fugitive dusting is observed from the top of fly ash silo in CPP I & II plant area. • Unit has not provided OCEMS with CPP-II. • Housekeeping and ambient air quality in PAP Plant area is found poor. • Dried ETP sludge is disposed off into their own SLF site. Total 6 nos. SLF Pits are exhausted & remediated and found covered with soil. • Leachate collection wells (4 nos.) of operational SLF Pit no.7 are observed full with leachate wastewater (at overflow level). Leachate transfer facility i.e. fix		• Fly ash silo maintenance issue taken care with bag filters attached with fly silo have been cleaned out immediately. • On OCEMS for CPP II, the plant was planned to be stopped permanently years before and was not in operating condition. The plant was never made operational thereafter too. This is general observation no violation noted. • On Housekeeping, the observation was a suggestive measure and no violation noted.	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				pump and pipeline is not provided for transferring leachate from leachate wells to ETP.			
2	**07/02/2017**	Inspected w.r.to with reference to CTE-Amendment Application for the increasing the capacity of Continuous Cast Copper Road plant.	Acid mist-124.24 mg/Nm3 (stack attached to SAP-3 plant)	• Acidic wastewater accumulation was observed near PAP plant and opposite SA plant. • Minor quantity of acidic wastewater was observed in storm water drain adjacent to compound wall of phospho gypsum storage yard. • Housekeeping and ambient air quality in PAP plant area was observed very poor	Issued SCN on 17/04/2017	• Violations mentioned are taken from inspection dated 08/11/2016 and not fresh observations. An update had been sought, letter from Industry dated **10/02/2017** indicate that all the points were complying. • The unit informed that the Acid mist observed to be momentary aberration and not observed in subsequent monitoring over the years.	04
3	**11/02/2017**	Inspected w.r.t. telephonic complaint on 11/02/2017 at 13:30 Hrs, by Mr. Sanjay Gohil (Mobile No. 8401345685) from nearby village Lakhigam regarding release of gas	---	• Heavy Fugitive gaseous emission resulting foggy atmosphere was observed at PAP Plant which was due to leaking of Hydrogen Fluoride Fumes from hood top of Phosphoric Acid reactor. • Fugitive dusting was also observed from partially covered rock	Issued SCN on 17/04/2017	• The observations was made during the plant startup and industry in reply dated 17/02/2017 has confirmed, the fugitive emissions has been controlled immediately by improving scrubber efficiency as per the start-up procedure. • Observations is closed and complied.	157

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				phosphate powder heaps, kept near plant area on open land.		• As mentioned by reply from Hindalco dated **17/07/2017**, Rock Phosphate in open space near plant had only localized fugitive dust and has been covered by the industry with tarpaulin immediately**.** • Opening and covering of heap is regular practice to handle solid materials.	
4	**18/02/2017**	Inspected w.r.t. telephonic complaint made by Shri Sanjay Gohil resident Lakhigam regarding suffering of health problem by villagers due to air pollution arise.	---	• Fugitive dust emission is observed from Di ammonium Phosphate (DAP) plant area. • Heavy gaseous emission of ammonia and HF from process vent of DAP plant through scrubbing system. • Eye and nose irritation is sensed near Phosphoric acid plant due to HF fumes emitted from its cooling tower. • Acidic water overflowed from PAP plant area was observed being accumulated in nearby storm water drain line of factory.	Issued SCN on 17/04/2017	• Industry reply dated **22/02/2017**, mention that this fugitive white plume observed were of water vapor did not contain any gases which is common for DAP plant. There were no violation linked with this. • Violations mentioned are taken from inspection dated 08/11/2016 and not fresh observations. An update had been sought, letter from Industry dated 10/02/2017 indicate that all the points were complying.	05

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
5	**27/02/2017**	Inspected with reference to complaint. Complaint is received from Sanjay Gohil of lakhigam village.	---	• Dusting is observed in Phosphoric acid plant and Di Ammonium phosphate plant.	Issued SCN on 17/04/2017	• Industry in the reply dated **02/03/2017** mentioned that localized dusting was due to floor construction activities in the DAP Plant area.	04
6	**01/04/2017**	Inspected With reference to Telephonic complaint on 01/04/2017 at 22:30 Hrs., from Mr. Kishorsinh Rana of Dahej (Mobile No.9924971030) regarding air pollution coming	---	• There was a gaseous leakage of lean gas from Heat Exchanger unit after first stage of DCDA and before second stage converter and fugitive gaseous emission is observed settling down to ground level within the SAP plant area. Minor SO2 gas is felt at plant area	Issued SCN on **12/05/2017**	Industry in the reply dated 01/04/2017 mentioned the fugitive gaseous emission was steam leakage from SAP heat exchanger first stage. There unit claims that there was no violation identified.	42
	2018						
7	**13/06/2018**	Inspected with ref to the complaint of Shri MSH Sheikh, President, Brackish Water Research Centre, Olpad.	RPM- 4061 mircro gram/Nm3 (Ambient air sampling near Scrap yard) Wastewater Discharge line: pH- 9.21	• unit has an another discharge pipeline along with pump connected to First stage treated w/w holding lagoon from which partially treated w/w (without treatment in second stage ETP) can be discharged from this pipeline.	Issued NOD under EPA-1986, Water Act-1974 & Air Act 1981 **29/09/2018.**	The unit has replied for the observed violations and the same is given below: "As suggested by GPCB officials, lagoon line was already disconnected. Now, there is only one final discharge line i.e. from Reverse Osmosis Plant Reject to deep sea. Lagoon water is being recycled in the plant. The Ambient Air quality monitoring instrument installed by GPCB was very close to the internal material transportation road. The atmospheric	82

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						condition was completely adverse. The wind velocity was observed 46.9KMPH, which was very high caused stormy and windy condition, which ultimately impact the dusting environment, that ultimately capture as fine dust in RSPM instrument. The slightly higher pH (9.21) was due to sudden breakdown of effluent transfer pump, where as lime dosing was in streamline which caused the slightly high pH in the treated effluent. The breakdown pump has been an resolved within half an hour and the pH is well within limit".	
				• Ponding of water/wastewater is observed at back side of ETP lagoon outside premises. Soil near Ponding looks yellowish and black colored.		The observation closed on: 13.06.2018 The reply submitted as below: We are investigating the source of water accumulated behind the ETP boundary. We assure that the water accumulated is not discharged from our premises. The hose was kept for withdrawal of accumulated water.	
				• unit is using water for dust suppression in copper slag storage heaps, near smelter No.3, which leachate is spreading to nearby open area outside premises resulting huge ponding of wastewater outside premises near this location. The color of this w/w		The observation closed on: 13.06.2018 The reply submitted as below: In line with your suggestion, we have	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				ponding is having greenish tinge. • Due to leakages from the top of caustic scrubber -1, strong S02 is felt in Smelter-1 area • Strong SO2 smell is felt near Sulphuric Acid (SA)-1 Plant. In the SA -1 plant • External and internal thick coating of dust is observed in the DAP plant, which indicates inefficient operation of the APCMs. • Heavy dusting is observed from the Conveyor belt for the conveyance of Powder material, bottom of the		reduced the nozzle size for dust suppression. This has addressed the concern raised by you. Area is dried up and there is no inflow of water. The observation closed on: 13.06.2018 The reply submitted as below: The corrective action has been taken, the top cover has been provided on secondary stream smelter -1 scrubber. And there is no acidic smell in Ambient Air now. The observation closed on: 13.06.2018 The reply submitted as below: The water U seal label has been changed and leakage has been arrested. Hence there is no smell of gas in SAP. The observation closed on: 13.06.2018 The reply submitted as below: While comprehensive preventive action plan has been put in place to mitigate the fugitive emission, the reason for the deposit was on account of the quality of rock, which has since been changed. The current stock of rock which caused the deposit has been consumed. We do not anticipate similar situation with the	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				spray dryer which is observed spreading in to atmosphere. • Strong Acidic fume is sensed near cooling tower of PAP plant due to usage of Wastewater in cooling tower • Water in all the storm water drainage near PAP, DAP and SA-1 plant is found acidic. • Vent of sulphuric acid (98%) storage tank are found open to atmosphere. Unit has not installed		change of quality of the rock. The observation closed on: 13.06.2018 The reply submitted as below: The dust suppression measure is already taken, and presently we are spraying water in CPP, SLF and on road parallel to SLF through truck mounted sprinkler. Dedicated jumbo sweeping machine and contractor has been deployed to clean the roads The observation closed on: 13.06.2018 The reply submitted as below: As per the technology provider, the PAP cooling tower is required to be operated in acidic water condition (1.25% P2O5). The copy of Original Equipment supplier guidelines is attached as Annexure-7.To arrest the smell, installation of cloth curtain with Cooling tower towards the road side is under progress. It will convert the mist into droplet and the acidic water will be taken back to the cooling tower. We expect the acidic smell to go down substantially. This will be completed by end of July, 2018. The observation closed on: 13.06.2018 The reply submitted as below:	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				manometer at most of the bag filters. • Installed manometers in some Bag filters are not working. • Unit has not installed any APCMs to copper cathode chamber to the scrub the residual acidic fumes. • Huge quantity of phsopho gypsum is stored n open within premises hence due to high wind speed in coastal area heavy dusting is spreading in to the atmosphere.		While we have separate drain for both acidic water and storm water, we have erected a sump-pump to collect the acidic water to the PAP plant in case of breakdown. . The observation closed on: 13.06.2018 The reply submitted as below: The vent is provided to take care of any emergency release of fumes only. This is as per the design of the manufacturer. In our view based on discussions with the manufacturer, it may not be feasible to connect this small vent kept open for emergency with scrubber. The reply submitted as below: The bag filters are already fitted with digital manometers. This did not have any environmental violation. The observation closed on: Not applicable The reply submitted as below: We are using fresh water for cleaning of cathode in copper cathode cleaning chamber. Therefore, the possibility of residual acidic fumes from cathode	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• Unit is using storm water drainage as a wastewater (i.e acidic and alkaline) conveyance line at PAP, DAP, SA-1, CPP plant area. • Unit has not provided wet scrubber or any other APCMs in coal handling area. • Heavy dusting is observed from the huge qty of fly ash dumped on open land opposite the CPP-2/3 and spreading in the ambient air. • Dry fly ash was found lying in the open below the ESP of CPP-1 as well as in the surrounding area, creating dusting in the area due to blowing wind.		cleaning chamber is nil. The observation closed on: 20.06.2018 The reply submitted as below: The Phosphogypsum stored at many locations contains 30- 40% moisture. Therefore, the possibility of fugitive emission from stored Phosphogypsum and belt conveyor is minimal. However, we will try to convey the Phosphogypsum smoothly up to the disposal point, so that there will be no spillage and fugitive emission from belt conveyor system. Analysis report for moisture content in Phosphogypsum available with us and can be made available if required. The observation closed on: 13.06.2018 The reply submitted as below: While we have separate drain for both acidic water and storm water, we have erected a sump-pump to collect the acidic water to the PAP plant in case of breakdown. Coal yard has been made best in class with various initiatives over the years. Scrubber is not applicable in coal handling.	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• Huge heaps of fly ash stored in open due to this heavy dusting spearing in atmosphere		The observation closed on: 14.06.2018 The reply submitted as below: Fly ash is not stored in CPP area. However, some quantity of fly ash is stored in designated area because of little delay of getting bulker.	
				• Storage of the Phosphogypsum sludge is observed not in environment friendly manner		The observation closed on: 14.06.2018 The reply submitted as below: Fly ash is not stored in CPP area. However, some quantity of fly ash is stored in designated area because of little delay of getting bulker	
				• Any water sprinkling is not carried out at the approach road of SLF site and heavy dusting is observed at the approach road of the SLF		The observation closed on: 14.06.2018 The reply submitted as below: Fly ash is not stored in CPP area. However, some quantity of fly ash is stored in designated area because of little delay of getting bulker	
				• unit is dumping plastic and		The observation closed on: 14.06.2018 The reply submitted as below:	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				insulation waste near SLF 7 in open area in haphazard manner.		The Phosphogypsum stored at many locations contains 30- 40% moisture. Therefore, the possibility of fugitive emission from stored Phosphogypsum and belt conveyor is minimal. However, we will try to convey the Phosphogypsum smoothly up to the disposal point, so that there will be no spillage and fugitive emission from belt conveyor system. Analysis report for moisture content in Phosphogypsum available with us and can be made available if required. The observation closed on: 13.06.2018 The reply submitted as below: As explained during your visit we have tanker with water sprinkling system to suppress the fugitive dust emission generated from approach road and vehicle movement. We have increased the frequency of tanker used for sprinkling The observation closed on: 13.06.2018 The reply submitted as below: Insulation and plastic waste dumped near SLF-7 have been removed	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
2019							
8	**30/07/2019**	Inspected with ref to telephonic complaint of Shri Jayendrasingh Rana (representing labour union of the unit) regarding Air Pollution problem	---	• it is observed that there is leakages in inlet & outlet duct of Gas Heat Exchanger of SA-3 plant from which there is continuous emission of acid fumes which is spreading in open atmosphere in nearby area. • ammonia odor is felt in the PAP plant area • Looking to overall observation, it seems that there is fugitive emission of SO2/ SO3 in the SA-1 & SA-2 plants and fugitive emission of ammonia in PAP plant • Acidic wastewater (pH @ 2 on pH strip) is observed in storm water drains near SA-1 plant, SA-3 plant and PAP plant • acidic wastewater (pH @ 2 to 4 on pH strip) is being discharged into sea (CRZ area) from the two separate storm water drains: (1) passing through beside Road No.	Issued Closure Direction under section 33-A of the Water Act-1974 with 15 days effect on **31/08/2019**	The unit has replied for the observed violations and the same is given below: *"All these inspection related comments are in the backdrop of unprecedented torrential rain from 26th July to 4th August, 2019 (on 4th Aug, 2019 rainfall was 266 mm in a day and 200 mm in 4 hours). Subsequently, the entire Dahej region had experienced flooding for weeks together. Our plant being at downstream was worst hit.* The observation was closed on 02.08.2019. Please refer our reply on the same date against the observation. ✓ Number of days to close the observation: 2 days ✓ Thermal shock from rainwater had led to cracks in metal duct and was taken care of with mechanical maintenance immediately. The observation was closed on 02.08.2019. Please refer our reply on	32

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				20 and (2) passing through Road no. 3 of the unit. • Looking to overall observations, it seems that unit has not taken any measures to prevent contamination of storm water drain and to prevent discharge of contaminated storm water drain under Monsoon Action Plan		the same date against the observation. ✓ Number of days to close the point: 2 days The observation was closed on 02.08.2019. Please refer our reply on the same date against the observation. ✓ The problem was over immediately with the stoppage of rain. GPCB on their subsequent visit verified the condition of Rd20 and Rd 3 drains with satisfaction ✓ Number of days to close the observation: 1 day This is a general comment. We respect the comment/observation, however the situation needs to be looked into the perspective of sudden change in rainfall pattern in Dahej region."	
9	**10/08/2019**	Inspected with ref to telephonic message received from higher authority regarding death of worker due to collapse of conveyor belt due to acidic leakage of plant	---	• Mr. Akhileshkumar singh, helper of M/s. Sunil enterprise, age- 25 years who was carrying out cleaning work at conveyor belt junction tower fell down along with part of the structure and died.	Issued Closure Direction under section 33-A of the Water Act-1974 with 15 days effect on **31/08/2019**	The unit has replied for the observed violations and the same is given below: *"All these inspection related comments are in the backdrop of unprecedented torrential rain from 26th July to 4th August, 2019 (on 4th Aug, 2019 rainfall was 266 mm in a day and 200 mm in 4 hours). Subsequently, the entire Dahej*	22

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• Contaminated rain water ponding having pH @ 4 to 6 on pH strip is observed in and around storm water drain near SAP-1 plant at road no. 6. • Contaminated acidic rainwater patched is observed surrounding SAP-1 plant. • Looking to the situation at SAP-1 plant, there is possibility of leading this contaminated rain water into sea through storm water drain • Water logging is observed in many area of the plant due to rain. • General housekeeping is observed poor during visit.		*region had experienced flooding for weeks together. Our plant being at downstream was worst hit.* This is a general comment and observation. ✓ No of days to close the observation: Not applicable ✓ Due to heavy rain and high wind velocity, a part of the platform in CPP3 transfer tower to coal conveyor had fallen down due to higher load because of accumulation of coal dust, de-choked from chute, soaked with rainwater. The **observation was closed on 12.08.2019**. Please refer our reply on the same date against the observation. ✓ No of days to close point: 1 day ✓ SAP1 storm water drain system was under renovation from the year 2018 and was a contained area. The storm water drainage in SAP1 did not have any connectivity with our storm water network and till today the status is same. All	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						the monsoon water is recycled back into the system and is treated in ETP. This is general point and also related to unprecedented rain and flood in the region. The observation was closed on 12.08.2019. Please refer our reply on the same date against the observation. ✓ No of days to close the observation: Not applicable as it is not a violation ✓ This is a general observation and suggestive point and against that multiple initiatives were taken".	
2020							
10	**19/09/2019**	Inspected w.r.to after revocation	---	• heavy acidic fugitive emission in form of white cloud formation is observed from Phosphoric acid plant(PAP) • it has been noticed that acidic fumes being emitted through leakages in PAP digestors and reactors (no. 1 & 3) and open manhole of one scrubber attached to PAP plant. severe eye irritation	Issued SCN on **24/01/2020**	The unit has replied to the observed violations and the same is given below: "Both the observations had originated from the same issue and was closed on 23.09.2019. Please refer our reply on the same date against the observation. ✓ No of days to close the observation: 1 day ✓ The accidental failure and subsequent stoppage of the	128

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				is felt in nearby of PAP area. • acidic water being accumulated in storm water drain line of PAP plant area is observed • Acidic bluish colored wastewater is being transferred from storage tank near work in progress area to cooling tower of PAP plant through two water tankers having registration number 1. GJ 03 AX 5096 & 2. GJ 12 Y 7495		plant for maintenance was carried out proactively and during visit, GPCB had also observed that". The unit in their reply has mentioned the following: "This is an incident of seepage in a contained area and not a violation. ✓ No of days to close the observation: 1 day ✓ This was an incident of minor seepage leading to accumulation in small puddle in an under construction drain. The drainage system of PAP and the entire plant is a contained area and water managed inside the plant was through recycling and ETP treatment. ✓ Accidental failure and subsequent stoppage of the plant for maintenance was carried out proactively and	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• post closure SLF site cell number 2, 6 & 7 are observed damaged due to soil erosion during heavy rain. Stone patching work is observed damaged at several locations of cells. internal liner is also torned at some portions. • Leachate well of running SLF site – 8 is observed being submerged into rain water		during visit, GPCB had also observed that". The unit in their reply has mentioned the following: "The observation mentioned was part of water management plan and was part of water recycling". The unit has replied to the violations observed and the same is given below: ✓ The repair work was completed on Nov'2019 ✓ This is not a non-compliance point but a regular post monsoon maintenance requirement. ✓ The SLF design is such that, no environmental problem gets created because of monsoon related damages in embankment and liner. Inside liner the soil embankment protects the SLF integrity. ✓ Stone pitching is an additional	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						protection we provide proactively and not a need as per CPCB guideline. The unit in their reply has mentioned the following: "The **observation was closed on 23.09.2019.** Please refer our reply on the same date against the observation. ✓ No of days to close the observation: **2 days** ✓ This situation was created because of flood in the region during the season. However, sump height was raised immediately by one level, so that monsoon water could not go inside".	
11	**09/10/2019**	Inspected w.r.to compliance after revocation of the Direction	---	• stone pitching on embankment on soil of the embankment is so far not carried out	Issued SCN on **24/01/2020**	The unit has replied to the violations observed and the same is given below: ✓ No of days to close the observation: Not applicable, as the issue was getting repeated from the visit date of 19.09.2019.	108

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
12	**08/11/2019**	Inspected w.r.to telephonic complaint of Shri Manish Rana, Paryavaran Suraksha Samitee, Ankleshwar regarding disposal of Phospho Gypsum in the open land beside N.H.-8, Opp Reliance Petrol Pump near Bharuch	---	• about 1000 MT of the Phospho Gypsum is kept stored on the open land at the complaint site • Transport contract is given by the unit to various transporter for transporting the Phospho Gypsum from the plant of the unit to railway yard. M/s Sujal Logistics P. Ltd is one of the transporters to whom transport contract is given to transport the Phospho Gypsum from the plant of the unit to railway yard. • The delivery challan dated 07.11.2019 sent by the complainant indicates that the Phospho Gypsum being stored/ dumped in the compliant site (open land) by M/s Sujal Logistics P. Ltd, which is verified by the delivery challan issued by the unit on 07.11.2019. • it is observed that the delivery challan dated 07.11.2019 bearing same number is issued to M/s Sujal Logistics P. Ltd for transporting Phospho Gypsum from the plant to the Railway yard and it confirms that the Phospho Gypsum bringing from the plant premises of this unit is being stored/ dumped by M/s	Issued Notice of Direction under Section 31-A of Air Act 1981 on **03/02/2020**	The unit has replied to the violations observed and the same is given below: "The observation was closed on 11.01.2020. ✓ Phosphogypsum is disposed on Ex-factory basis to Cement Industries. These cement industries have contracted with the transporter M/s Sujal Logistics Private Limited for lifting and transporting the phosphogypsum from our premises and onward transit-storage and handling at railway yard. The transporter had stored in the same on their own land during transit to railway yard. ✓ However, we have exercised whatever influence we can do to the cement industries and transporter".	88

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				Sujal Logistics P. Ltd on the open land at the complaint site (instead of transporting it to Bharuch Railway Yard as per delivery challan).			
13	**24/06/2020**	Inspected with reference to a complaint letter of Lakhigam Gram Panchayat received through CPGRAMS portal regarding noise pollution, air pollution and water pollution caused by this unit and labour/ land looser issues in this unit	---	• Dusting is observed from the Coal handling area. • housekeeping near ETP and CPP plant area are found poor	Issued SCN on **05/10/2020**	The unit has replied to the violations observed and the same is given below: "The observation was closed on 07.07.2020. ✓ No of days to close the observation: **Not applicable** ✓ The observation was very generic in nature and in line to our improvement activities in coal yard as submitted earlier to GPCB. The visiting officials suggested to complete the ongoing projects like wind screen and bag filters at transfer tower quickly ✓ There was no dusting found (not mentioned anything like dusting in coal yard in SCN), but only suggestion was to implement the projects as soon as possible".	104

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						The unit in their reply has also mentioned the following: "The observation was closed on 07.07.2020. Please refer our reply on the same date against the observation. ✓ The observation was very generic in nature and no violation was committed".	
2021							
14	**18/02/2021**	Inspected with ref to HO letter (Haz Cell) dated 18.01.2021 regarding site visit as per TDSF protocol of Common & Captive TSDF	---	• there is excessive moisture content in the some waste freshly disposed at the captive TSDF site.	Issued SCN on **20/03/2021**	The unit has replied to the violations observed and the same is given below: ✓ The observation closed on: 19.02.2021 through reply ✓ This is not a violation as no environmental harm committed. ✓ The number of days to close observation: 02	31
15	18/03/2021 **19/03/2021**, **20/03/2021**	Inspected with ref to the complaint of Shri MSH Sheikh, President, Brackish Water Research Centre, Olpad and CTE	Stack attached to centralized scrubbing system of	• continuous seepage of acidic greenish colored wastewater is observed in Sulphuric acid Plant 1(SAP 1) area. seeped wastewater is being accumulated in kutcha	Issued Notice of Direction under section-5 of the EPA-19860n	The unit has replied to the violations observed and the same is given below: "The number of days to close observation: 01	170

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
	(3 day monitoring)	Amendment application	Smelter-III: PM- 390.4 mg/Nm3 SO2- 299.32 ppm Stack attached to main stack of SA plant-1: Acid Mist- 195 mg/Nm3 Stack attached to CPP-1 boiler: SO2- 97.96 ppm Stack attached to CPP-III boiler: SO2- 40.69 ppm Ambient sampling behind	drain in about 15 meter* 0.5-meter area with 3 feet depth. • Sludge deposition on tank internal walls of ETP tanks is observed • provided ESPs are found not working and heavy stack emission of SO2 gas and particulate matter is observed being emitted through stack attached to centralized scrubbing system of smelter plant 3 • Heavy fugitive emission of SO2 gas is also observed through leakages at various location of duct line of smelter plant 3, and eye and nose irritation is felt due to heavy SO2 gas emission in work zone area of smelter plant 3 • Actual results of parameters like	**04/09/2021**	The observation closed on: 18.03.2021 The issue was a minor and localized one arisen out of ongoing civil maintenance activity for process drain. Immediately the same was evacuated in front of GPCB officials. Reply submitted on 31.03.2021". ✓ This is not a violation but a suggestive comment. ✓ The number of days to close observation: 03 days ✓ The observation closed on: 21.03.2021 The unit in its reply has mentioned the following: "The number of days to close observation: 02 The observation closed on: 20.03.2021 The reply was submitted on 31.03.2021". The unit in its reply has mentioned the following:	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
			smelter-III: RPM- 276 micro gram/Nm3	Particulate matter and SO2 are not reflected in OCEMS of stacks attached to centralized scrubbing system of smelter plant 3 • Dusting is observed at various location of construction site area in factory premises. • installation of wind breaking wall in coal storage/handling area is going on, five nos. bag filters for coal crusher plant are observed newly installed but still to be commissioned. • water sprinkling system in periphery of coal handing area is not provided. • Distance between the two heaps of coal is not maintained as per coal handling guide lines • Copper slag and Construction & Demolition waste (C & D waste) is		"The number of days to close observation: 02 The observation closed on: 20.03.2021 This happened suddenly during Smelter3 shutdown operation because of bellow-duct leakage. During shutdown replacement activity was done. The reply submitted as below 31.03.2021". The unit in its reply has mentioned the following: **"**This is not a violation but drift in analyzer calibration. The reply was submitted on 31.03.2021". The unit in its reply has mentioned the following: **"**The number of days to close observation: It was matter of few hours. Immediately water sprinkling tanker was mobilized. The observation closed with a reply on 31.03.2021".	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				observed being dumped in open land area (16-hectare area) located north side of smelter plant 3. leachate generated due to dumped copper slag is observed being accumulated in three small wastewater ponding. • copper slag is observed being dumped in about 10-meter width area of Reserved Forest, along the boundary wall of factory premises (outside the factory premises), behind the 16-hectare land area. Leachate wastewater is observed being accumulated in Reserved Forest area in the form of small wastewater ponding. (@ 2meter dia with 2 feet depth) which are generated due to previously discharged wastewater and dumped copper slag. Whitish spots due to salt precipitation/deposition is observed in huge area of Reserved Forest		The unit in its reply has mentioned the following: ✓ This was an ongoing project activity and was not a violation. ✓ The point was closed through reply on 31.03.2021. ✓ This observation was not pointed out to us during inspection and appeared in a follow up visit report. We always had sprinkler in our coal yard and used to maintain sufficient gap between heaps. ✓ Copper slag and C&D waste was stored within the premises only and not a violation. ✓ Copper slag does not generate any leachate ✓ We have respected and valued the comment and immediately taken action to shift to a designated place. ✓ The number of days to close observation: Not applicable ✓ The observation closed with a reply on: 31.03 2021.	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						✓ The observation closed on: Reply and update were forwarded time to time ✓ Contacted Forest department immediately to provide permission	
16	**05/08/2021**	Inspected with ref to HO email dated 29/07/2021 regarding compliance status of Industry with reference to written instruction issued on 18/03/2021	-----	• There is still deposition of sludge in two Neutralization/ Reaction tanks. • The installation of proposed wind screens at North & West sides are completed and at South side partially completed, however the wind screen at East side is yet to be installed. • Upgradation of drain & road in the coal handling area is yet to be carried out • some small copper slag heaps are	Issued Notice of Direction under section-5 of the EPA-19860n **04/09/2021**	The unit has replied to the violations observed and the same is given below: ✓ Reply of Notice of direction dated: 17.09.2021 ✓ Growth of sludge is quite normal in any lime based neutralization tank and not a violation. ✓ The number of days to close observation: 01 ✓ The observation closed on 05.08.2021 with a reply ✓ This was a query to ongoing project update. Not a violation. ✓ The number of months to close observation: 06 (Project was slightly delayed due to COVID-Condition)	31

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				still stored in open land area • The previously observed Copper slag dumped and wastewater ponding in the reserved forests area are observed still there.		✓ The observation closed on: 30.09.2021 ✓ The comment was in the context of some left over copper slag. ✓ The same was also cleared within a day. ✓ This is in continuation to the inspection on 18th March, 2021. ✓ The observation is yet to be closed. ✓ Forest department permission is required.	
17	**08/11/2021**	Inspected with ref to Notice of Direction issued dated 04/09/2021	--	• Copper slag is observed being dumped in about 10-meter width area of Reserved Forest along the boundary wall of factory premises (outside the factory premises) behind the 16, hectare land area. • Unit has not lifted previously dumped copper slag from Reserved Forest area. • Ponding of storm water	Issued Notice of Direction under section-5 of the EPA-19860n **16/11/2021**	The unit has replied to the violations observed and the same is given below: ✓ This is in continuation to the inspection on 18th March, 2021 and not new observation. ✓ The observation is yet to be closed. ✓ Forest department permission is required. ✓ No fresh violation observed ✓ The ponding was due to rainfall	08

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				contaminated storm water is observed in Reserved Forest area behind the 16- hectare land area of the unit. Analysis Report (AR) of sample collected from contaminated water/water ponding in the reserved forest area shows pH: 6.33, COD: 59 mg/l, NH3-N: 6.16 mg/l, Copper:3.71 mg/l. • Analysis Report [AR) of Ambient sampling point: AAQM carried out at 16 hectare area [behind the Smelter-3, common stack) shows RSPM: 442 mg/m3 which is high.		✓ This is not a new observation or fresh violation. ✓ The parameters of pH, COD, ammoniacal nitrogen in AR report are well within acceptable limit and reflects monsoon accumulation. The copper is marginally higher than acceptable limit to 3 mg/l and shows monsoon accumulation related dilution compared to pre-monsoon reading of 28.71 mg/l for soil. ✓ As soon as we get the permission from forest department, the water evacuation will take about a month and subsequently soil amelioration followed by plantation activities will start in supervision of forest department.	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
				• Analysis report [AR] of Samples collected from stacks shows unit is not complying emission norms prescribed in CCA. • Unit has not provided adequate green belt and plantation area.		✓ The number of days to close NOD: 01 ✓ The observation closed on: 17.11.2021 ✓ The area is at our 16 Ha land (Smelter-3 Workshop Area), which is 130 mtr to the North of the plant. Since the area is a low-lying area, it was recently backfilled and is under development. The area, where monitoring device was installed **could be influenced by open land, backfilling, soil preparation and plantation activities along the periphery** of the boundary and relatively higher wind velocity due to close vicinity to the sea. ✓ However, we have been diligently continuing with the sprinkling at nearby roads with dedicated water tankers.	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						There were 3 stacks and 3 parameters out of 18, were found at higher side. **Sm3 scrubber:** ✓ Because of ongoing shutdown operation and sudden dust load to scrubber, the operation got impacted for a day. ✓ No exceedance observed thereafter. **Sm1 scrubber:** ✓ The issue was an aberration and mostly due to old control system. ✓ Identified and corrected within 8 hours. ✓ No exceedance thereafter. **SAP1 stack:** ✓ Acid Mist was never found during periodic monitoring or by GPCB also thereafter. ✓ Could be a momentary reading We are complied with the	

Sr. No.	Inspection date	Reference	Sample Result failed	Violation observed	Action Taken	Date of closure of observation and related details	No. of days of non-compliance
						greenbelt requirement. ✓ The observation was suggestive in nature for the newly developed area related boundary. ✓ We have done plantation there also and closed the point with a reply on 11.11.2021.	
						Total number of days	**1020**

Note: While visiting the unit, violations observed by GPCB were noted along with the action taken. The unit had given evasive reply immediately to justify themselves and to submit their compliances in short period. There is no answer on exactly when the compliances are achieved and hence the maximum number of days are considered in those cases.

REPORT

ON

INSPECTION-CUM-MONITORING
OF
M/S HINDALCO INDUSTRIES LIMITED
DAHEJ, BHARUCH
GUJARAT

IN THE MATTER
OF
OA NO. 70/2021 (WZ)

CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE, VADODARA

GUJARAT POLLUTION CONTROL BOARD
REGIONAL OFFICE, BHARUCH

MARCH, 2022

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REPORT ON INSPECTION-CUM-MONITORING OF M/S HINDALCO INDUSTRIES LIMITED, AT & POST DAHEJ, LAKHIGHAM, GIDC ESTATE DAHEJ, DIST – BHARUCH, GUJARAT CARRIED OUT JOINTLY BY CENTRAL POLLUTION CONTROL BOARD AND GUJARAT POLLUTION CONTROL BOARD DURING 18.02.2022 & 19.02.2022

1.0 BACKGROUND

Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi passed an order in the matter of Original Application No. 70/2021 (WZ) (Brackish Water Research Centre v/s Gujarat Pollution Control Board & Others) on 05th January, 2022. The matter is based on the Application made by the Applicant before the Hon'ble National Green Tribunal about grievance in the application against continued violation of Birla Copper Plant being operated by Hindalco at Villages about continued violation of Birla Copper Ltd (M/s. Hindalco Industries Ltd) located at Villages Lakhigam & Dahej, Tal-Vagra, District- Bharuch.

Hon'ble NGT vide its said order dated: 05.01.2022 directed to constitute a seven member joint committee headed by Hon'ble Justice B.C. Patel, former Judge of Gujarat High Court & former Chief justice of J&K and Delhi High Courts with representatives of MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF and GCZM as members. Accordingly joint committee is constituted under the chairmanship of Hon'ble Justice B. C. Patel. The said order also directs that meeting of the Committee may be convened preferably within three weeks.

Relevant portion of the order of Hon'ble NGT dated 05.01.2022 is reproduced below:

"20. In the light of above, we consider it appropriate to constitute a seven member joint Committee headed by Justice B.C. Patel, former Judge of Gujarat High Court & former Chief Justice of J&K and Delhi High Courts with representatives of MoEF&CC, CPCB, GPCB, SEIAA, Gujarat, PCCF (HoFF) Gujarat and Gujarat Coastal Zone Management Authority as members. The CPCB and State PCB will be the nodal agency for coordination and compliance. Meeting of the Committee may be convened preferably within three weeks. The Committee or such of its members as may be decided by the Chairman may undertake visit to the site and interact with stakeholders. The Committee will be free to co-opt any other expert/ institution for its assistance and conduct proceedings online, if necessary. The parties will be free to put forward their respective written version before the Committee

through the GPCB within three weeks from today. The Committee may preferably give its report within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF. A copy of the report may also be uploaded on the website of GPCB for response of the parties, if any before the next date."

In response to the said order of Hon'ble NGT dated: 05.01.2022, the joint Committee was constituted and meetings of the committee headed by Hon'ble Justice B.C. Patel are being convened from time to time. During one of the joint Committee's meeting held on 15.02.2022, the Hon'ble Chairman of the joint Committee enquired the Regional Office of GPCB to share current compliance status of the industrial unit considering past observations to which it was decided that a joint team of CPCB and RO-GPCB will visit the industrial unit (M/s. Hindalco Industries Limited) in a day or two and will submit a report to the committee along with analysis report of the samples collected to assess overall compliance status of the unit. It was also suggested that the operational status of various units in the industry shall be verified and the compliance status of observations & recommendations made by GPCB during the previous visit shall also be verified during the visit. The status of the storage of hazardous & other waste shall also be verified and shall be reported along with photographs. The copy of the minutes of meeting of the joint committee held on 15.02.2022 is attached in **Annexure-1**. Accordingly, inspection and monitoring of M/s. Hindalco Industries Ltd., Dahej was jointly carried out by the following officials from CPCB & GPCB during 18.02.2022 to 19.02.2022.

1. Shri S. Pradeep Raj, Scientist-D – CPCB, Regional Directorate, Vadodara
2. Shri Falgun M. Modi, Regional Officer - GPCB, Regional office, Bharuch
3. Shri B. D. Prasad, DEE- GPCB, Regional office, Bharuch
4. Shri N. D. Patel, DEE- GPCB, Regional office, Bharuch
5. Shri R. R. Gaekwad, AEE- GPCB, Regional office, Bharuch
6. Shri R. P. Buha, SSA - GPCB, Regional office, Bharuch
7. Shri B. D. Pandey, SSA - CPCB, Regional Directorate, Vadodara
8. Shri D. J. Rana- SLA - CPCB, Regional Directorate, Vadodara

2.0 ABOUT THE INDUSTRY

Birla copper a unit of Hindalco Industries Limited (earlier known as Indo Gulf Corporation Ltd.) has set up a copper smelting and refining complex in the year 1997 at Survey No. 29 to 39,101,104 to 110,112 to 115,117 to 122, 1504/P of village Dahej (Plot No. 2 of Dahej GIDC) and Survey No 646 to 671, 679, 685, 732 to 742, 744 to 752 of Village: Lakhigam, Taluka: Vagra, Dist: Bharuch, Gujarat.

The plant manufactures Copper Cathode, continuous cast copper rod, Sulphuric acid and precious metals. The unit has an Oxygen plant, Effluent Treatment Plant and captive power plants. The unit also has its own jetty. The Copper Smelter Complex is located at about $21^0$42' N Latitude & $72^0$33'E Longitude with the Total area of 327 Ha.

Initially the plant was set up with a 1,00,000 TPA capacity Copper Cathode capacity in 1998, which was further augmented to 1,50,000 TPA in 2003, 2,50,000 TPA in 2004 and 5,00,000 TPA in 2006. Cast Copper Rod Capacity has been expanded from 1,12,000 TPA to 2,40,000 TPA in 2009 and subsequently to 4,84,000 TPA in 2017.

The unit has obtained ISO 14001 certification for environmental management system and ISO 9001 certification for its quality system. The unit also has valid Public Liability Insurance and holds licenses under Factory Act and Indian Explosives Act.

The location of the Industry with marking of the boundary, adjacent Villages, Jetty of the industry located in Gulf of Khambhat are earmarked on Google image and shown in Figure below.

Figure: *Marking of boundary of the industry and its location on Google Image*

The layout of the industrial complex showing various plants inside the premises is given in Figure below.

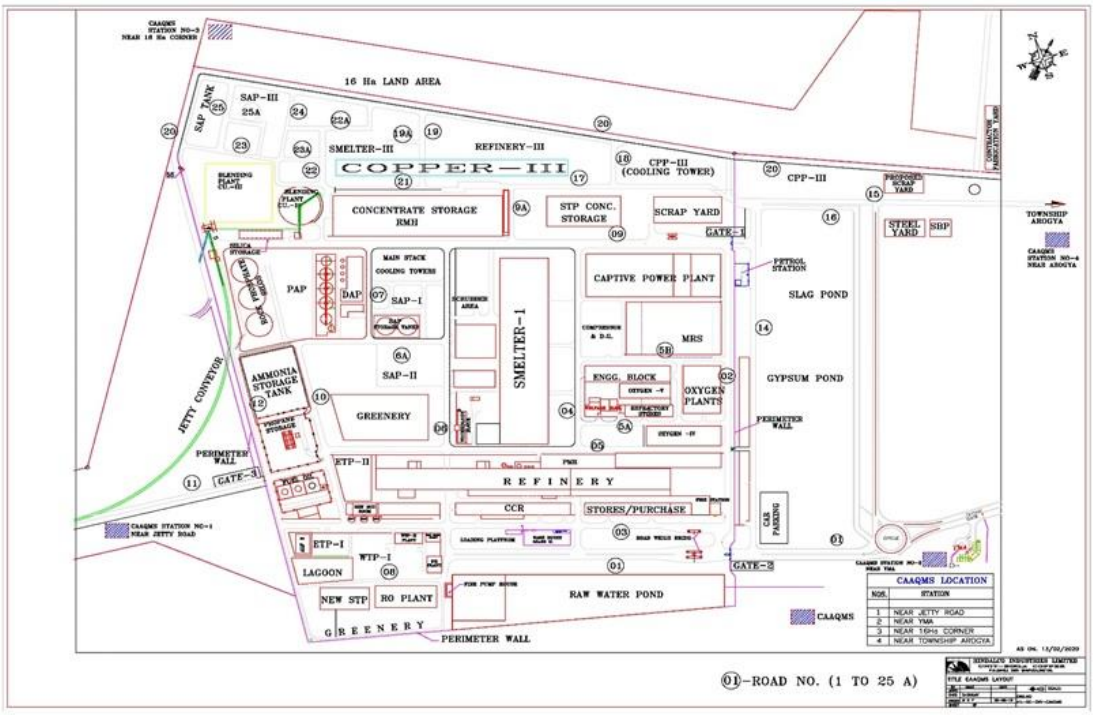


Figure: *Layout of industrial complex showing all the plants in the premises*

2.1 CONSENTS & ENVIRONMENTAL CLEARANCES

M/s Hindalco Industries Limited has obtained Consolidated Consent for Authorization (CCA) from Gujarat Pollution Control Board (GPCB) vide Consent Order No. AWH-1028216, dated: 30.05.2020 with validity up to 02.03.2026 for the production of following Products & By-products:

S. No.	Products	Quantity (MT/Annum)
1.	Cathode Copper	500000
2.	Sulfuric Acid (98.4%)	1470000
3.	Oxygen (Tech)	780000
4.	Gold	26
5.	Silver	200
6.	CC Rod	484000
7.	Phosphoric Acid (as P2O5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60
10.	Copper Wire (< 4 mm dia)	60000

S. No.	Name of By-Products	Quantity (TPM)
1.	Selenium	60 TPM
2.	PGM Concentrate	0.0508 TPM
3.	Granulated slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	Hydro fluosilicic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

The industry had earlier obtained CCA from GPCB vide Consent order no. AWH-62117 issued on 11.06.2014 for the production of above same products and by-products except Copper wire and with quantity of CC Rod being 240000 TPA. The said CCA was valid up to 02.03.2019 and later amended on 07.10.2014 with extension of validity of CCA up to 02.03.2020. Copy of the said CCA dated: 11.06.2014 & its amendment and the present CCA (Consent Order No. AWH-1028216 dated: 30.05.2020) are given in **Annexure-2** for reference.

Presently, the industry has completely stopped the Phosphoric acid plant and Di ammonium phosphate plant and therefore production of Phosphoric Acid (as P2O5) and DAP/NPK Fertilizer is completely stopped and the generation of by-products namely Phosphogypsum, Hydro fluosilicic acid and Aluminium Fluoride is Nil.

The industry has obtained Environmental Clearance (EC) from Ministry of Environment, Forest & Climate Change (MoEF&CC), New Delhi vide F. No. J-11011/7/94-IA.II dated: 14.03.1995 for the Copper Smelter project and captive Jetty facility at Dahej and subsequently obtained ECs during 2002, 2004, 2005, 2009 & 2017 for increase in production capacities of products & captive power plants and for setting up of new plants. The details of the Environmental Clearances obtained from MoEF&CC by the industry are summarized in table below:

S. No	EC Details	Summary
1	J-11011/7/94-IA II Dated: 14 March, 1995	Manufacture 1 lakh tons per annum of copper cathode and captive Jetty.
2	J-11011/81/2000-IA.II (I) Dated: 8 Jan, 2002	Increase in the capacity of Copper smelter plant from 1.0 lack TPA to 1.5 lack TPA and Copper foil unit will be 2000 TPA.
3	J-11011/85/2002-IA.II (I) Dated: 10 Feb, 2004	Expansion proposal is for increase in the capacity of copper smelter plant from 1.5 lakh TPA to 2.5 lakh TPA and setting up of zinc smelter plant of 1.0 lakh TPA capacity
4	J-11011/220/2004-IA.II (I) Dated: 18 March, 2005	Copper Smelter Expansion from 2,50,000 TPA to 5,00,000 TPA and from 67.35 MW to 146.5 MW Captive power plant
5	J-11011/927/2008-IA.II (I) Dated: 11 Feb, 2009	Expansion of Continuous Cast Rod (CCR) Plant from 1,20,000 TPA to 2,40,000 TPA.
6	J-11011/927/2008-IA.II (I) Dated: 23 Feb, 2017	Expansion of Continuous Cast Copper Rod Plant (CCR) capacity from 2,40,000 TPA to 4,84,000 TPA by setting up a new CCR Plant of 2,44,000 TPA.

3.0 FINDINGS AND OBSERVATIONS

3.1 CURRENT STATUS WITH RESPECT TO VIOLATION MENTIONED IN APPLICATION FILED IN HON'BLE NGT

During the visit on 18.02.2022 & 19.02.2022, M/s Hindaloco Industries Ltd. was found operational and all plants (except Phosphoric acid plant and Di ammonium phosphate plant) were in operation. The industry has stopped plant operations of Phosphoric acid

plant and Di ammonium phosphate plant permanently. The cooling tower of the Phosphoric acid plant was already dismantled and dismantling of main plant will be started in a short time as informed. Presently, the Industry has two Captive power plants: CPP-1 & CPP-3, which are observed in operation. The third Captive Power plant (CPP-2) has been dismantled. The present status observed with reference to violations mentioned in the application filed before NGT is as under:

S. NO.	VIOLATION MENTIONED IN APPLICATION FILED IN HON'BLE NGT	COMPLIANCE STATUS AS ON 18.02.2022
1	Untreated water from Copper Slag storage area flowing into CRZ-1A area.	All the storm water drain within the premises found dry and no waste water/contaminated water is going outside premises during the visit.
2	High Hydrogen fluoride (HF) emissions from Phosphoric Acid Plant etc.	PAP Plant has been closed permanently and initiated the dismantling process.
3	Sulphuric acid parameters of 25 mg/ Nm^3 (normal cubic meter) not being met on account of non-functional acid mist eliminator.	During visit, abnormal emission from the SAP plant stacks is not observed visually. Stack emissions sampling are carried out from the stack attached to SAP Plant – 1 as well as SAP Plant – 3 to check emission from the stacks and the analysis results are found within the norms prescribed in CCA.
4	Groundwater Contamination.	Ground water samples from the 10 peizometric borewells located within premises of the industry are collected to check the contamination in ground water. The analysis results of GW samples indicate: i. Copper in the range of 0.02 to 0.48 mg/l, ii. Cadmium in the range of BDL to 0.23 mg/l iii. Chromium in the range of: BDL to 0.41 mg/l iv. Lead & Arsenic are BDL for all the samples. v. Nickel in the range of 0.003 to 0.214 mg/l vi. Zinc in the range of 0.5 to 11.54 mg/l The variation in the values for few parameters among the different locations may be due to the varying depth of piezometer wells.
5	Dumping of Arsenic bearing sludge in captive TSDF site without encapsulation.	Arsenic Bearing residue (containing 10 to 15 % Arsenic) generated from the refinery plant

		is recycled in the smelting furnace and there is no disposal of this Arsenic bearing residue. ETP sludge generated contains 1.5 to 2 % of arsenic. It is informed that the arsenic content ETP sludge is in stable salt form and which doesn't leach. ETP sludge is disposed in own captive SLF. Samples of leachate from leachate collection sumps of operational SLF – 8A and 8B was collected to check the arsenic content in leachate of SLF. The analysis results of the samples collected from the sump no.01 and sump no. 05 attached to SLF 8 reveals that the Arsenic concentrations are BDL and 0.4mg/L in sump no. 01 & 05 respectively. The leachate being collected in the leachate collection sumps are further treated in the ETP of the unit.
6	Non-provision of leachate collection system for captive TSDF SLF Cell No.7.	Leachate collection system is provided in all SLF Cells including SLF-7.
7	Leachate water from captive TSDF site travelling out of the unit premises into the Gulf of Khambhat.	Previously, reportedly there was overflow from the leachate collection sump of SLF – 7 during monsoon. To prevent such situation, unit has raised height of leachate collection sumps and all leachate collection sumps are provided with top covers to prevent entry of rain water into the sump. Leachate generated in the leachate collection sump is transferred into ETP of the industry through tanker. The frequency of tankers has been increased to avoid large accumulation in the leachate collection sump. During visit, there is no overflow from any of the leachate collection sumps.
8	Release of Sulphur oxides (SOx) and Sulphur dioxide (SO2) from the manufacture of Sulphuric acid from the Sulphuric acid plant (SAP) due to inefficient scrubbing system and improper functioning of APCM (air pollution control monitoring devices) causing eye irritation amongst the residents of the nearby villages.	During visit, abnormal emission from the SAP plant stacks is not observed visually. Stack sampling are carried out from the stack attached to SAP Plant – 1 and SAP Plant – 3 and the analysis results of the same are found within the norms prescribed in CCA.
9	It is also observed that unit has connected another pipeline to RO reject discharge line from first stage treated w/w holding lagoon (which is bypass line bypassing the second state treatment ETP) and can be discharged directly from the first stage treated w/w Holding lagoon without polishing treatment.	The pipeline bypassing the second stage treatment which was observed earlier has been removed. Presently, there is only one discharge line from final outlet of ETP to the deep sea disposal point.
10	Ponding of water/wastewater is observed at back side of ETP lagoon outside the premises. Soil near ponding looks yellowish and black colored.	No water/waste water ponding observed anywhere within the premises.
11	Unit is using water for dust suppression in copper slag storage heaps, near smelter no.3 which leachate is	Copper slag previously stored in open area near smelter – 3 has been shifted into

	spreading go nearby open area outside the premises resulting in huge ponding of waste water outside premises near this location.	dedicated copper slag storage yard. There is no copper slag storage found in open area near smelter-3 and there is no ponding of wastewater or contaminated water inside the premises during the visit.
12	Due to leakages from the top of caustic scrubber1 strong SO_2 is felt in this area.	The leakages observed earlier in the scrubber in SAP-1 have been rectified and presently there is no leakage in the scrubber and no any fugitive emission observed during the visit.
13	Strong SO_2 smell is felt near Sulphuric Acid Plant1.	SO_2 smell is not felt in the SAP-1 area during the visit.
14	Heavy dusting is observed from the conveyor belt for the conveyance of powder material.	There was dusting observed earlier in the conveyor belt in PAP plant. Presently, PAP plant has been stopped permanently and there is no such dusting observed during the visit.
15	Unit has not provided wet scrubber or any other APCMs in coal handling area.	Unit has provided covered conveyor system for transportation of coal and also provided Bag filters at Conveyor junction towers (3 nos.) and at crusher (1 No.). Carrying out dust suppression using mobile mist canon in the coal yard area. Provided garland drain around the coal yard & roads beside coal handling area has been converted to concrete roads. Further, unit has provided wind screens at all sides of the coal handling area. The unit has provided peripheral sprinklers and a dry fogger machine in the coal yard.
16	Heavy dusting is observed from the huge quantity of fly ash dumped on open land opposite CPP-2/3 and spreading in the ambient air.	Unit has provided two Fly Ash silos of capacity 600 MT and 1200 MT with pneumatic conveying system and disposal by closed bulker to control dusting from fly ash.
17	During inspection, huge quantity of Phosphogypsum is found stored in the Phosphogypsum storage yard within the premises which is open to sky. Storage of Phosphogypsum sludge is observed not in environment friendly manner.	The source of phosphogypsum generation was PAP plant. The unit has already stopped PAP plant and presently no generation of phosphogypsum sludge. The old stock of phosphogypsum is being sent to cement industries and sent for fertilizer use. Presently, unit has stock of 12,00,000 MT of Phosphogypsum sludge, which is completely covered with HDPE liners.
18	Continuous Seepage of acidic greenish colored wastewater is observed in SAP 1 area. Seeped wastewater is being accumulated in kachcha drain.	The source of the earlier observed seepage of acidic greenish colored wastewater in SAP-1 area had been already identified & rectified and seepage was stopped. The accumulated seeped wastewater was already taken into ETP for further treatment.

		Further, the internal process drain has been changed from kachcha drain to RCC drain. During inspection no leakage/ seepage of wastewater or accumulation of wastewater is observed at this location.
19	To remove deposited sludge in ETP tanks to increase efficiency of ETP.	During inspection, three Neutralization/ Reaction tanks are observed in smooth operation without any sludge deposition and the remaining two tanks are found empty for receiving effluent.
20	ESPs attached to Smelter plant 3 are observed not in operation during shut down and cleaning period of smelter plant 3 furnaces. Heavy dust & SO2 gas emission is observed being emitted through process vent of common scrubber of Smelter plant 3.	The ESP attached to the smelter plant-3 has been replaced completely with new one. The APCM provided with the Smelter Plant-3 including ESP is found in operation during the visit. During visit, abnormal emission from the Smelter plant-3 is not observed visually. Stack sampling are carried out from the stack attached to Smelter plant-3 and the analysis results of the same are found within the norms prescribed in CCA.
21	During visit, Heavy fugitive emission is observed from various locations of duct line of Smelter plant 3 due to leakages in duct line. To rectify all leakages to avoid fugitive emissions.	The duct line in the smelter plant-3 has been revamped and provided with new ESP. During visit, no fugitive emission observed from the duct line of Smelter plant-3.
22	Actual Results of parameters like PM and SO_2 are not reflected in OCEMS of stacks of Smelter plant 3. Hence, frequent calibration of OCEMS provided in different Stacks should be done.	All the OCEMS provided with various stacks including OCEMS provided with stack of Smelter are calibrated and found working during inspection.
23	Evaluate the efficiency and adequacy of all provided ESPs.	The efficiency and adequacy evaluation of the ESPs of CPP-1 & 3 plants has been carried out by an expert agency, M/s Soil & Enviro Industries Ltd. As per their recommendation, for all the three boilers High Frequency Transformer (HFTR) and replacement of selected collecting plates in some fields were carried out through an agency namely M/s Ador Powertron.
24	DAP and H_3PO_4 plants are closed since April 2020 for carrying out modification work. Submit time bound action plan for modification/upgradation of DAP and H3PO4 plants.	DAP and H_3PO_4 plant are permanently closed. It is informed that they have decided to dismantle these plants. Cooling towers of H_3PO_4 plant has been dismantled completely.

25	To implement coal handling guidelines properly for coal storage yard. Also submit time bound action plan for the same.	Unit has provided covered conveyor system for transportation of coal and also provided Bag filters at Conveyor junction towers (3 nos.) and at crusher (1 No.). Carrying out dust suppression using mobile mist canon in the coal yard area. Provided garland drain around the coal yard & roads beside coal handling area has been converted to concrete roads. Further, unit has provided wind screens at all sides of the coal handling area. The unit has provided peripheral sprinklers and a dry fogger machine in the coal yard Unit has also provided tyre washing facility with catch pit to collect tyre washed wastewater.
26	Regular water sprinkling should be carried out in construction area to prevent dusting.	During inspection no construction activity is going on.
27	Copper slag and C&D waste is observed being dumped in open land area (16 -hectare area) located north side of Smelter plant 3.	All the previously observed copper slag and C&D waste dumped in open land of 16-hectare area are completely shifted to dedicated storage area. The 16 Ha land has been cleared and the unit has started plantation in the said area.
28	Copper slag is observed being dumped in about 10-meter width area of Reserved Forest, along the boundary wall of factory premises, behind the 16-hectare land area. Leachate wastewater is observed being accumulated in Reserved forest area in the form of small wastewater pondings, generated due to previously discharged wastewater and dumped copper slag. Whitish spot due to salt precipitation is observed in huge area of Reserved forest.	The copper slag which was dumped earlier by the unit in forest area is still lying there. Also, shallow ponding of water observed at two locations in the said forest area during the visit. Water samples collected from the said two locations. During the visit, the soil samples were collected at seven different locations in the reserved forest area and from one location in the 16 Ha land of factory premises to assess the probable contamination of the area due to dumping of copper slag by the industry. Two samples collected from each locations. One sample collected at the depth of 0.5m and another sample collected at a depth of 1.5m from the ground level as per the sampling protocol for the screening of contaminants wrt contaminated sites (mentioned in the Reference Document on Identification, Inspection and Assessment of Contamination sites prepared by CPCB in

		June 2020 based on the guidance document for assessment and remediation of contaminated sites in India, issued by MoEF&CC). The samples were collected in presence of representative of Forest Department, Government of Gujarat.
29	To ensure preventive and corrective actions to prevent any seepage/discharge of wastewater or dumping of any solid waste in Reserved Forest area and CRZ area.	Unit has constructed boundary wall around the premises of the unit. Also, provided proper drainage system and piping network to prevent seepage of wastewater and to prevent dumping of solid waste in the adjacent forests area or any other open area.
30	To furnish the details about utilization of copper slag in road construction in Dahej GMB port area and also give clarification about the same.	As per detail furnished by the unit, they have supplied total 79658.95 MT of copper slag to M/s Sterling Port Ltd., Dahej during 2009-11. It is understood that M/s. Sterling Port Ltd. has utilized the purchased copper slag for road construction for their proposed jetty. During the present visit, it is observed that the road construction activity of the proposed jetty has been abandoned half-way and mangroves developed densely in either side of the said abandoned road. Further onwards the unit has not supplied any copper slag to M/s. Sterling Port Ltd.
31	Green belt and plantation area should be developed in periphery of factory premises to control dust emission.	As informed by the industry, they have developed about 117 ha green belt area out of total 342 ha of their premises. Recently they have started planting saplings in 16-hectare area along boundary wall within the premises.

The photographic comparison of status of industry with respect to the visit carried out by GPCB on 18.03.2021 and the joint visit by CPCB & GPCB during 18 -19.02.2022 are given in table below:

Photographs taken by GPCB during the Inspection on 18th March, 2021	Photographs taken during the joint visit by CPCB & GPCB during 18th & 19th February, 2022
 *Fugitive Emission observed in Smelter-3 area.*	 *Present status in smelter-3 area.*
 *Wind breaking wall at coal yard observed under constuction*	 *The construciton of Wind breaking wall around coal yard is completed*

Fugitive emissions observed in ESP area

Present status at ESP area in smelter -3 area without fugitive emission

New ESP in smelter -3

Whitish spots due to salt deposition is observed in huge area of Reserved Forest and unremoved copper slag.

Present status of the same in Reserved Forest area

Photographs taken by GPCB during the Inspection on 18th March, 2021	Photographs taken during the joint visit by CPCB & GPCB during 18th& 19th February, 2022
 *Leachate wastewater is observed being accumulated in Reserved Forest area*	 *Presently shallow ponding of water accumulated in Reserved Forest area*
 *Sludge deposition in internal wall of ETP tanks*	 *One of the primary reaction tank with cleaned internal wall*
 *Copper slag dumped in Reserved Forest area*	 *Present status of in the same reserved forest area.*

4.0 ENVIRONMENT MANAGEMENT SYSTEM

4.1 WASTEWATER MANAGEMENT

The unit has provided two Effluent Treatment Plants earmarked as ETP-1 and ETP-2 having installed capacity of 4800m^3/day each. Industrial effluent streams from various plants like Smelter, Refinery, Sulphuric Acid plant, PMR plant is sent to main ETP by pumping through pipeline, which is collected in Raw Effluent Tank - I & II for each ETP stream. The effluent from Smelter-1, SAP-1, Refinery-1 and PMR goes to ETP-I and effluent from Smelter-III, SAP-III and Refinery-III goes to ETP-II. The treated wastewater from both the ETPs are collected in a common lagoon and pumped to secondary stage treatment at RO system for further treatment. The RO system with pre-treatment is having a capacity of 5400 m^3/day. Presently, the RO permeate (i.e. the treated wastewater) is reused in the plant and the RO reject is discharged into deep sea at a point (Lat. 21^0 42' 00", Long. 72^0 30'35") recommended by NIO and approved by GPCB, which is located at their Captive Jetty. A HDPE pipeline (3.2 km long) is installed for disposal of treated effluent from ETP-RO plant. The unit has installed ETP tertiary stage (Tertiary Water Recycling Unit- TWRU) of 2000 m^3/day capacity for further treatment of RO reject and thereby reducing the discharge of RO reject in the deep sea. The TWRU is ready for commissioning during the visit.

The unit has installed a Sewage treatment Plant with Membrane Bio-Reactor based technology of 500 m^3/day capacity to treat the domestic wastewater.

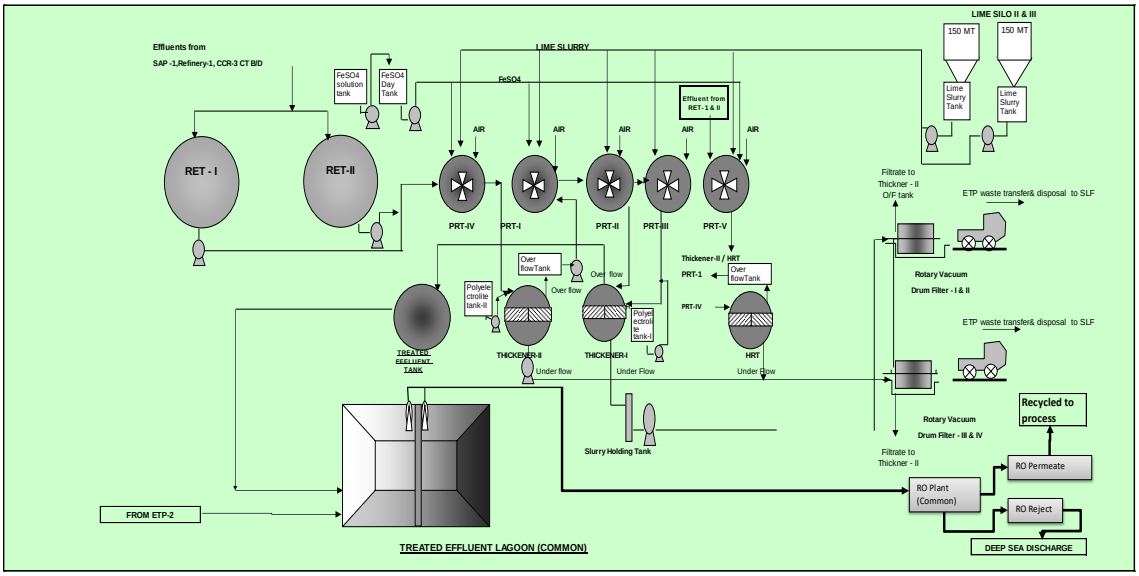


Figure: *Flow diagram of ETP-1*

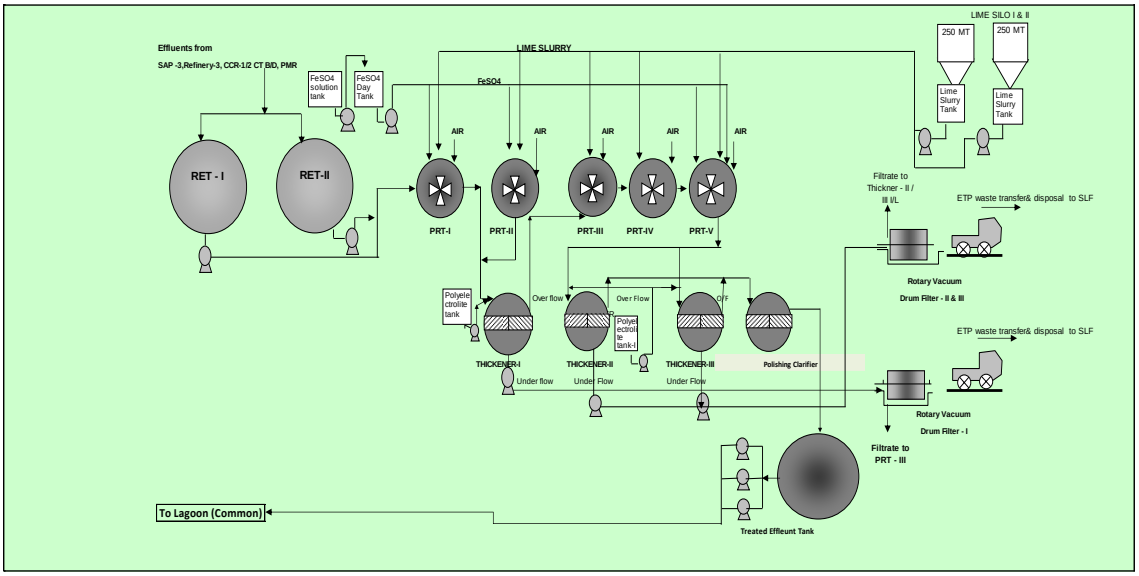


Figure*: Flow diagram of ETP-2*

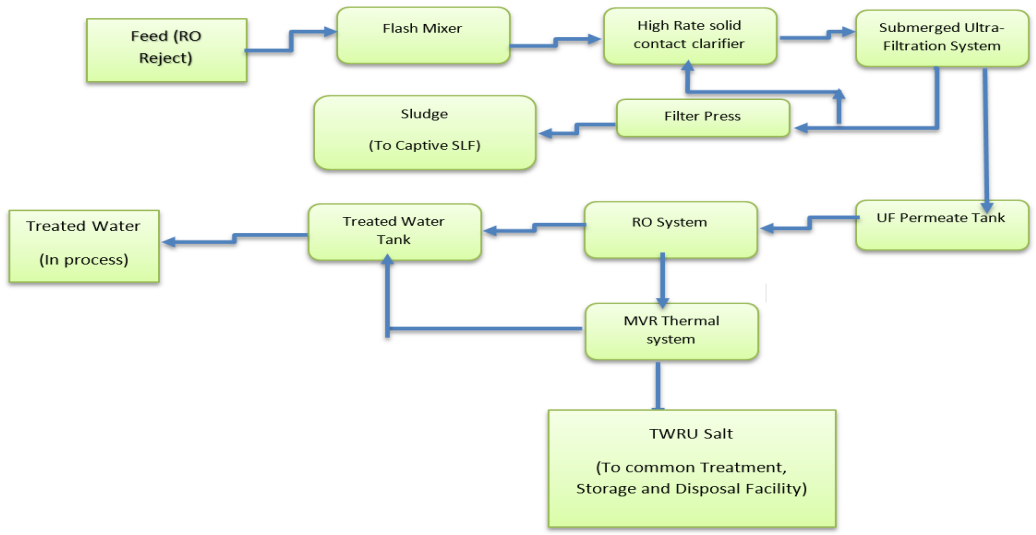


Figure: *The process flow diagram of Tertiary Water Recycling Unit (TWRU) which is under commissioning during visit*

4.2 AIR POLLUTION MANAGEMENT

The details of the Air pollution control devices attached to Flue gas emission stacks installed in various plants in the premises are given in table below.

Table: *Details of APCD attached to various Flue Gas Stacks*

Sr. No.	Stack Attached to	Stack Height in meter	Air Pollution Control Measures	Parameter	Permissible Limits
1	Dore Furnace of PMR Plant	45	Bag Filter	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
2	Package Boiler	43	Scrubber	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
3	Sulphuric Acid Pre Heater-I	30	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
4	Sulphuric Acid Pre Heater-II	30	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
5	D. G. Set-I	30	Cyclone Separator	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
6	D. G. Set-II	30	Cyclone Separator	PM SO2 NOx	150 mg/Nm3 100 ppm 50 ppm

Sr. No.	Stack Attached to	Stack Height in meter	Air Pollution Control Measures	Parameter	Permissible Limits
7	Captive Power Plant (CPP- I) CFBC Boiler 35 MW	75	ESP+ Lime dosing system	PM SO_2 NOx	100 mg/Nm3 600 mg/Nm3 600 mg/Nm3
8	Shaft Furnace of CCR plant-I	26	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
9	Shaft Furnace of CCR plant-II	26	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
10	Sulphuric Acid Pre-Heater-III	38	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm
11	Captive Power Plant (CPP-II) AFBC Boiler 15.34 MW	60	ESP+ Lime dosing system	PM SO_2 NOx	100 mg/Nm3 600 mg/Nm3 600 mg/Nm3
12	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP	PM SO_2 NOx Mercury	50 mg/Nm3 600 mg/Nm3 300 mg/Nm3 0.03 mg/Nm3
13	Shaft Furnace of CCR plant-3	35	-	PM SO_2 NOx	150 mg/Nm3 100 ppm 50 ppm

The details of the Air pollution control devices attached to Process emission stacks installed in various plants in the premises are given in table below.

Table: Details of APCD attached to various process emission Stacks

Sr. No.	Stack Attached to	Height of Stack (m)	Air Pollution Control Measures	Parameter	Permissible Limits
1	Anode Casting of Smelter-I	20	-	PM SO_2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3
2	Main Stack Secondary Gas Scrubber of Smelter-I	75	Two stage alkali Scrubber	SO_2	40 mg/Nm3
3	Copper Scrap Melting Furnace (Cap. 50 TPD)				

Sr. No.	Stack Attached to	Height of Stack (m)	Air Pollution Control Measures	Parameter	Permissible Limits
4	Main Stack Slag cleaning Furnace of Smelter-I	75	Bag Filter	SO_2 PM	40 mg/Nm3 150 mg/Nm3
5	Main Stack Sulphuric Acid plant - I	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO_2	25 mg/Nm3 2 kg per ton of 100% conc. Sulphuric acid
6	Cathode Stripping M/C plant of Refinery-I	20	-	SO_2	40 mg/Nm3
7	Anode scrap washing M/C of Refinery-I	20	-	SO_2	40 mg/Nm3
8	Liberator Stack of Refinery-I	26	Scrubber	SO_2 Acid Mist	40 mg/Nm3 25 mg/Nm3
9	Slag Granulation of Smelter-I	45	-	PM	150 mg/Nm3
10	Steam Dryer for copper concentrate of Smelter-I	58	Bag Filter	PM SO_2	150 mg/Nm3 40 mg/Nm3
11	Slag Cleaning furnace (By pass Vent) of Smelter-I	46	Bag Filter	PM SO_2	150 mg/Nm3 40 mg/Nm3
12	Cathode Stripping M/C Plant of Refinery-II	20	-	SO_2	40 mg/Nm3
13	Centralized Scrubbing System Smelter-III	75	Bag Filter +alkali Scrubber	PM SO_2	150 mg/Nm3 40 mg/Nm3
14	Sulfuric Acid Plant SAP - III	75	5 Stage DCDA, Mist Eliminators, Tail Gas Scrubber based on dyna wave scrubber	SO_2 Acid Mist	1 kg per ton of 100% conc. Sulphuric acid 25 mg/Nm3
15	Cathode Stripping Refinery-III	20	-	SO_2	40 mg/Nm3
16	Liberator Stack of Refinery-III	26	Scrubber	SO_2 Acid Mist	40 mg/Nm3 25 mg/Nm3
17	DAP Plant	60	Dual media scrubber	PM SO_2 NOx NH3 HF	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3 175 mg/Nm3 6 mg/Nm3
18	PS Converter Area of Smelter-I (Gases are to be transferred to H2SO4 Plant) only emergency vent	47	-	PM SO_2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg/Nm3

Sr. No.	Stack Attached to	Height of Stack (m)	Air Pollution Control Measures	Parameter	Permissible Limits
19	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6 mg/Nm3
20	PMR Plant Phase-III	30	Bag Filter	PM SO_2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3

4.3 HAZARDOUS & OTHER WASTES MANAGEMENT

The details of hazardous and other waste being handled by the unit as per the CCA are given in table below.

Details of hazardous wastes management					
Sr. no.	**Name of waste**	**Category**	**Quantity generation Norms**	**Method of collection/storage & disposal of wastes**	**Composition of wastes**
1	ETP waste sludge & Scrubber waste	8.2/I	175095 TPA	Dewatered ETP waste is collected in dumper from Rotary Vacuum Drum Filter and disposed in to cells of TSDF developed within premises based on CPCB guidelines.	CaSO4 – 80 to 85%, Moisture-30 to 40%, Cu - 0.6 to 0.8%, Zn - 0.05 to 0.07%, Fe - 0.5 to 1.5%
2	Arsenic bearing sludge ,As-Cu precipitate	7.3/I	270.80 TPA	It is generated from Liberator section of Refinery plant. It is completely recycled to furnace of Smelter.	Cu - 50 to 75 %,As - 5 to 7%
3	Used oil	5.1/I	50 KL/Year	It is generated from electrical and mechanical operations when equipment is taken for repair.	Mainly oil & some moisture
4	Spent Electrolyte solution	8.1/I	52560 KL/Year	Spent electrolyte liquid generated from Refinery plant of Copper smelter plant is completely treated in ETP of Birla Copper.	Mainly Copper and other metals
5	Residue dust from SAP	17.1/I	12 TPA	It is the dust / acid containing residue generated due to cleaning of Sulfuric acid plant gas cleaning section /scrubbing system, which contains Copper and Iron too. It is completely recycled in to smelter plant furnace.	Mainly Copper, Iron & acid

Details of hazardous wastes management					
Sr. no.	**Name of waste**	**Category**	**Quantity generation Norms**	**Method of collection/storage & disposal of wastes**	**Composition of wastes**
6	Spent catalyst from SAP	17.2/I	160 KL/Year	It is the fines of catalyst generated during the screening/cleaning in Sulfuric acid plant. It is disposed in our captive SLF.	Mainly Vanadium Pentoxide
7	Used Empty Drums	33.3	780 Per Year	Used Empty drums are sent to authorised recyclers.	Mainly de-foamer chemical(Empty barrels/ Containers/ liners contaminated with hazardous chemicals /wastes)
8	Flue gas cleaning residue (Exhaust air /gas cleaning residue)	35.1/I	864 TPA	Dust is collected from gaseous stream attached to Slag cleaning furnace in closed vessel and completely recycled to Smelter.	Mainly Copper and Iron
9	Spent resin from WTP	35.2/I	7.5 KL/Year	It will be generated when resins are replaced in DM water plant every four years, which is used for water purification it will be sent to cell of TSDF within premises.	Mainly resins
10	Selenium & selenium compounds.	A-8/II	6 TPA	Generated from PMR plant as By Product and sent to re-processor.	Mainly Selenium & Silver
11	Silver compounds.	A9/III	6 TPA	It is generated during Dore metals processing and recycled internally in smelter.	Mainly Selenium & Silver
12	Inorganic Acid (Spent Acids)	B15/II	66960 TPA	It is a by-product generated from fluorine recovery section from Phosphoric acid plant.	Mainly Fluoride and silica
13	Dust & Lumpy	4/IV	35000 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in process or disposed authorised recycler,	Cu: 33-40%, As: 0.5-1.3%, Ag: 60-90 g/t, Bi: 300ppm, Pb: 0.5-1.0%
14	Copper Converting (C-Slag)	6/IV	6000 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in	Cu - 20 to 25 %,

Details of hazardous wastes management					
Sr. no.	**Name of waste**	**Category**	**Quantity generation Norms**	**Method of collection/storage & disposal of wastes**	**Composition of wastes**
				process or disposed authorised recycler,	
15	Liberator cake	4/IV	3000 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in process or disposed authorised recycler,	Cu: 85-95%, As: 0.30-1.0%, Au: 15-25 g/t, Ag: 280 ppm, Bi: 3000ppm, Sb: 1700ppm, As 1-2%
16	Copper Revert	4/IV	72000 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in process or disposed authorised recycler,	Cu - 30 to 35 %,
17	Dore Slag	6/IV	2500 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in process or disposed authorised recycler	Cu: 1-2%, As: 1-2%, Au: 50-200 ppm, Ag: 0.5 – 2%, Bi: 2-3%, Pb – 20 – 30% (Slags from copper processing for further processing or refining)
18	Lead Anode/ Cathode	7./I	80 TPA	Collection, Stored inside covered shed with impervious lined structure and recycled in process or disposed authorised recycler,	Mainly lead
19	Cotton waste used	33.2/I	15 TPA	Collected , Stored in Hazardous waste yard with impervious lined structure and disposed to authorised vendors	Contaminated cotton rags or other cleaning materials)
20	Used Insulation	X-X02	100 TPA	Collected, Stored in HDPE bags and disposed in own SLF	Used insulation waste generated in plant
21	Discarded PPE (Rubber)	X-X08	5 TPA	Collected , Stored in Hazardous waste yard with impervious lined structure and disposed to authorised vendors	Used PPE 1. Safety Shoe 2. Safety Goggles
22	Used membrane/ Filter cloth and bags	Z-Z37	20 TPA	Collected , Stored HDPE bags and disposed to authorised vendors	Used membrane and filter cloth and bags

The unit is having captive secured Landfill within its premises for disposal of few wastes generated in their process. The details of Captive Secured Landfill and its closure details are given in table below.

SLF NUMBER	DESIGN CAPACITY (MT)	DATE OF COMMISSION	DATE OF CLOSURE
1	30000	Apr-2001	Feb-2002
2	52000	May-2002	Jul-2003
3	83000	Aug-2003	Oct-2004
4	262000	Nov-2004	Dec-2007
5	262000	Jan-2008	Dec-2010
6	262000	Jan-2011	Jun-2014
7	262000	Jul-2014	Aug-2018
8	536400	Sep-2018	In use

The unit has provided designated storage shed for various Hazardous and Other wastes. The details of the storage sheds are given in below Table

S. No.	Type of Wastes	Shed Area	Storage Capacity
1	E Waste	50 m^2	10 Tons
2	Battery	50 m^2	10 Tons
3	Used Oil	100 m^2	30 Tons
4	Empty Drums and Cotton Wastes	100m^2	20 Tons

The unit has obtained membership from CHWTSDF of M/s. BEIL Infrastructure Limited at GIDC Dahej for the disposal of 50 MT/Year of hazardous & other solid waste vide membership no. OTH/790, dated: 01.12.2020.

The unit has obtained permission from MoEF&CC for the export of slags and liberator coke for the purpose of Recycling/ Recovery/ Reprocessing and the details of the same are given in table below.

Description of items	Date of permission	Quantity (MT)	Permission for Export to
Export permission for C-Slag (Copper converter slag) (Basel No. B1100)	19.04.2021	3000 MT	M/s. Cambodian Chaotuo Mining & Metallurgy Co. Ltd., Kingdom of Cambodia
Export permission for Dore Slag (Basel No. B1100)	19.04.2021	1000 MT	M/s. Korea Zinc Co. Ltd., Republic of Korea
Export permission for Liberator cake (Copper Flakes) (Basel No. A1120)	28.01.2021	3000 MT	Korea

5.0 ENVIRONMENT MONITORING BY CPCB & GPCB DURING THE VISIT

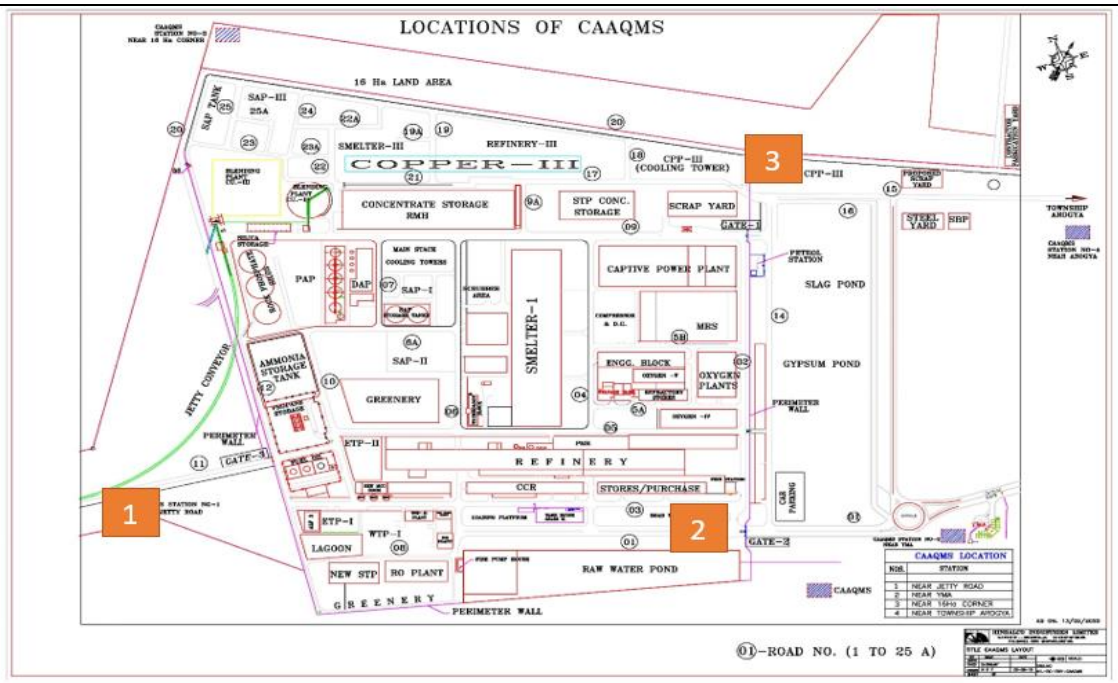
During the visit, monitoring of Ambient Air Quality, monitoring of source emission, sampling of ETP, Ground water sampling, leachate sampling, monitoring of water ponding in reserve forest, soil sampling in reserve forest area and within the factory premises was carried out jointly by CPCB and GPCB in presence of industry personnel. The details of sampling and monitoring and the analysis results are given in subsequent section of this report.

5.1 AMBIENT AIR QUALITY MONITORING

The ambient air quality was monitored at upwind and down-wind locations near to the boundary of the factory premises. The locations for the ambient air quality monitoring were identified by the CPCB & GPCB team considering the feasibility and accessibility for setting up the monitoring stations. One ambient air quality monitoring station was set up at predominant up-wind direction on top of the cabin on Jetty road at West corner of industry complex. Two stations set up at predominant down-wind directions; one downwind station was set up above weigh bridge cabin near main gate of the industry at south corner of the premises. Another downwind station was set up near coal yard about North-East corner of the factory complex.

The ambient air quality monitoring was carried out for 24 hours duration at three locations for the parameters PM10, SO_2 & NOx and the samples were analysed by GPCB. The

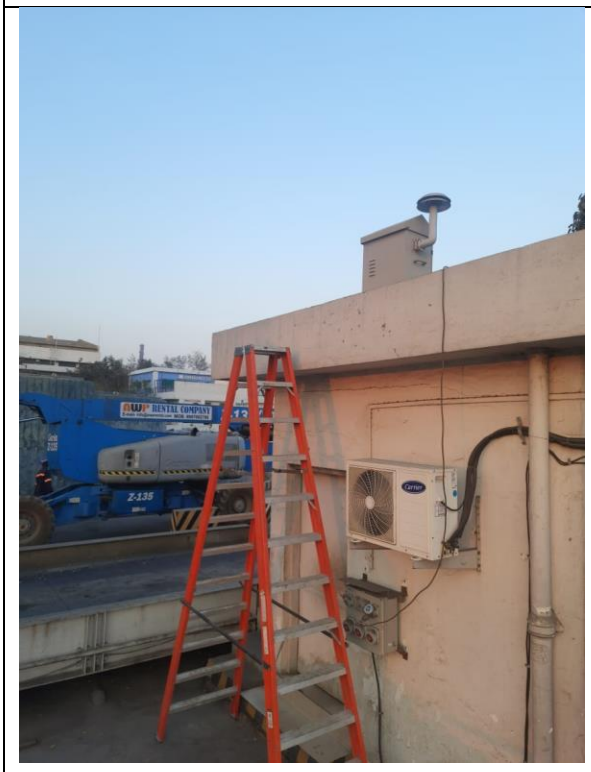
ambient air quality monitoring stations are marked on the industry layout and given in figure below. The ambient air quality monitoring stations are shown in photographs below. The analysis results of ambient air quality monitoring analysed by GPCB are given in table below.



Locations of AAQM location

Location -1: Near Jetty Road, Location-2: Near weigh bridge, Location-3: Near Coal yard

Photograph: AAQ station near Jetty road (predominant upwind direction)



Photograph: AAQ station top of cabin of weigh bridge (predominant downwind direction)

Photograph: AAQ station top of security cabin near coal yard (predominant downwind direction)

Table: *AAQM Results in Up-wind location & downwind locations*

S. No	Test Parameter	Unit	*Up-wind location (near Jetty road)*	*Down-wind location-1 (above weigh bridge cabin)*	*Down-wind location-2 (near coal yard)*	National AAQ Standard (notified by CPCB vide notification dated: 18.11.2009)
	Date of Sampling		18.02.2022 to 19.02.2022	18.02.2022 to 19.02.2022	18.02.2022 to 19.02.2022	
1	Particulate Matter (< less than 10 µm size) PM_{10}	µg/m^3	**139**	50	48	100
2	Sulphur Dioxide (SO_2)	µg/m^3	1.45	6.5	4.47	80
3	Oxides of Nitrogen (NOx)	µg/m^3	2.43	5.27	11.75	80

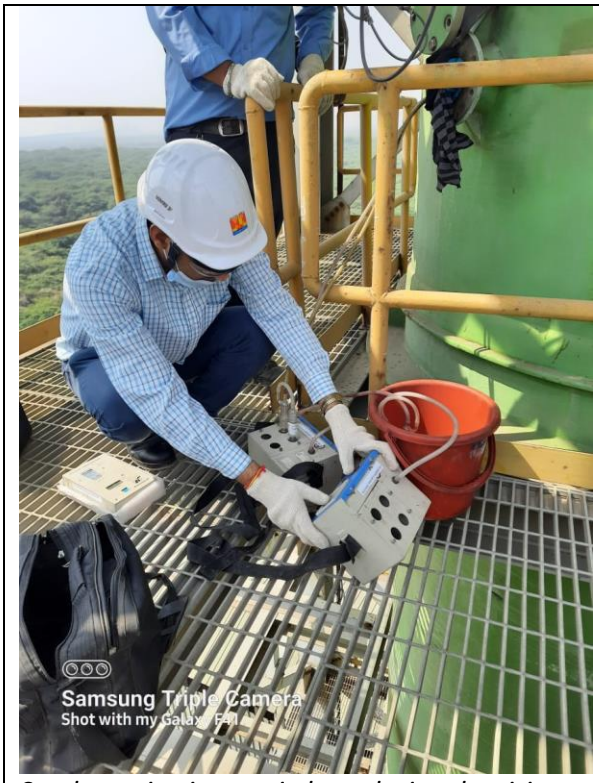
The concentration of Particulate Matter at upwind location, i.e. near Jetty road is 139 µg/m^3, which is higher than the National AAQ of 100µg/m^3, which may be due to truck movement in that area or cargo handling in other jetties located adjacent to the monitoring location as there was no activities in the Jetty of M/s. Hindalco Industries Limited during monitoring period. The other monitored parameters in other locations are within the National AAQ standards.

5.2 SOURCE EMISSION MONITORING

The source emission monitoring was carried out in the following operational stacks which are selected by the visiting team on the basis of criticality.

1. Main stack slag cleaning furnace of smelter-1
2. Common Stack attached to secondary scrubber of Smelter-1 & Copper scrap melting furnace of Smelter-1
3. Main stack of Sulphuric Plant-1
4. Main stack of Sulphuric Plant-3
5. Stack attached to centralized scrubber system of smelter-3

The source emission monitoring of identified stacks was carried out for the parameters prescribed in the CCA and the samples were analysed by CPCB. The stack monitoring carried out during the visit are shown in photographs below.



Stack monitoring carried out during the visit

Stack monitoring carried out during the visit

The analysis results of source emission samples analysed by CPCB are given in table below.

Table: Analysis results of Source Emission Monitoring (Sample collected from Main stack slag cleaning furnace of smelter-1)

Sr. No.	Parameters	Unit	GPCB Limit	Result
1.	Particulate Matter	mg/Nm^3	150	39.4
2.	SO_2	mg/Nm^3	40	2.74

Table: Analysis results of Source Emission Monitoring (Common Stack attached to secondary scrubber of Smelter-1 & Copper scrap melting furnace of Smelter-1)

Sr. No.	Parameter	Unit	GPCB Limit	Result
1.	SO_2	mg/Nm^3	40	BDL

Table: Analysis results of Source Emission Monitoring (Main stack of Sulphuric Plant-1)

Sr. No.	Parameter	Unit	GPCB Limit	Result
1.	SO_2	Kg per Ton of 100 % H_2SO_4	2.0	1.0017
2.	H_2SO_4 mist	mg/Nm^3	25	8.7

Table: Analysis results of Source Emission Monitoring (Sample collected from Stack attached to centralized scrubber system of smelter-3)

Sr. No.	Parameters	Unit	GPCB Limit	Result
1.	Particulate Matter	mg/Nm^3	150	48.5
2.	SO_2	mg/Nm^3	40	5.4

Table: Analysis results of Source Emission Monitoring (Sample collected from Main stack of Sulphuric Plant-3)

Sr. No.	Parameter	Unit	GPCB Limit	Result
1.	SO_2	Kg per Ton of 100 % H_2SO_4	1.0	0.23
2.	H_2SO_4 mist	mg/Nm^3	25	0.89

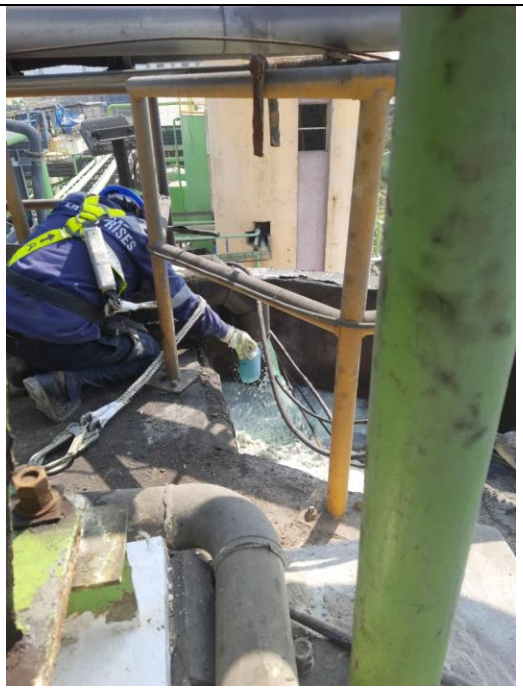
The analysis results of the samples collected from various stacks during the visit reveals that all the monitored parameters are within the norms prescribed in CCA by GPCB.

5.3 MONITORING OF ETP

During the visit, samples were collected from inlet and outlet of ETP as per the following details.

1. Untreated wastewater sample at inlet of ETP-1
2. Untreated wastewater sample at inlet of ETP-2
3. From final outlet (RO reject) which is being disposed into sea through pipeline.

The sampling carried out at inlet and outlet of ETP during the visit are shown in photographs below.



Wastewater sampling from inlet of ETP-1

Wastewater sampling from inlet of ETP-2

Wastewater sampling from final outlet of ETP (RO Reject)

The samples collected from inlet and outlet of ETP during the visit was analysed by CPCB. The results of ETP samples analysed by CPCB are given in table below.

Parameters	Inlet to ETP-1	Inlet to ETP-2	Final Outlet of ETP	Permissible Limits prescribed in CCA for outlet
pH	1.02	1.06	8.38	5.5 -9.0
Colour	--	--	20	100
TSS	734	572	74	100
COD	242	117	38	250
BOD	NR	7.6	0.5	100
NH_3-N	90	6.7	0.41	50
Phenols	0.160	0.176	0.145	5.0
S^{-2}	--	--	BDL	5.0
Cr^{+6}	--	--	BDL	1.0
CN^{-}	--	--	0.24	0.2
O&G	--	--	BDL	20
Cu	2201.45	629.35	0.20	3.0
Cd	22.23	13.87	0.03	2.0
Cr	1.24	0.62	BDL	2.0
Pb	11.30	8.45	BDL	1.0
Ni	1164.3	95.09	0.106	5.0
Zn	278.67	57.04	0.14	15.0

Note: *Except pH & Colour, all other results expressed in mg/L. The colour is reported in Hazen unit.*
**NR-Not reported due to high concentration of copper metal interference.*
** ****BDL****- Below detectable limit*

The analysis results of samples collected from RO reject which is being discharged in the deep sea for disposal reveals that all the monitored parameters are meeting the norms prescribed by GPCB in CCA for disposal in deep sea except cyanide. The concentration of cyanide in the final outlet is 0.24mg/L, which is marginally exceeding the prescribed limit of 0.2 mg/L in the CCA. Considering this, this unit may be asked to operate the ETP properly to achieve all the prescribed norms for outlet of ETP.

5.4 GROUND WATER SAMPLING

The unit has provided 10 nos. of Peizometric bore well around their captive SLF in their premises and earmarked all the borewells as Bore Well No.01 to Bore Well no. 10. All the

peizometric bore wells are provided with hand pump and designated as HP-01 to HP-10 for identification. The locations of 10 bore wells are given below.

S. No.	Sample Location
01.	BORE WELL – 01 (Southeast of SLF 1)
02.	BORE WELL – 02 (East of SLF 2)
03.	BORE WELL – 03 (North of SLF 3)
04.	BORE WELL – 04 (Northeast of SLF 3)
05.	BORE WELL – 05 (West of SLF 4)
06.	BORE WELL – 06 (East of SLF 5)
07.	BORE WELL – 07 (South of SLF 6)
08.	BORE WELL – 08 (South of SLF 7)
09.	BORE WELL – 09 (Northeast of SLF 8)
10.	BORE WELL – 10 (Northwest of SLF 8)

During the visit, samples were collected from all the 10 peizometric bore wells to assess the probable contamination of groundwater due to SLFs and samples collected during the visit was analysed by CPCB. The locations of said 10 bore wells are marked on Google image and given in figure below.

Figure: Locations of 10 bore wells marked on Google image

Few photographs showing the ground water samples collected from hand pumps of 10 peizometric bore wells around the captive SLFs during the visit are given in Table below.

 *Ground water sampling from hand pump of peizometric bore wells*	 *Ground water sampling from hand pump of peizometric bore wells*
 *Ground water sampling from hand pump of peizometric bore wells*	 *Ground water sampling from hand pump of peizometric bore wells*

Ground water sampling from hand pump of peizometric bore wells

Ground water sampling from hand pump of peizometric bore wells

The results of samples collected from 10 peizometric bore wells analysed by CPCB are given in below table.

Parameters	Locations									
	BW-1	**BW-2**	**BW-3**	**BW-4**	**BW-5**	**BW-6**	**BW-7**	**BW-8**	**BW-9**	**BW-10**
pH	7.75	7.11	7.36	7.13	7.84	7.41	7.02	7.96	6.97	7.46
Colour	BDL	10	BDL	BDL	BDL	BDL	BDL	BDL	75	BDL
TDS	17002	35954	4794	45521	6526	29584	64127	27295	39671	23669
NH3-N	0.57	1.22	0.82	0.35	0.14	0.41	1.6	2.17	0.82	0.38
Phenols	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cond.	34000	61600	8046	72000	9161	41446	75847	39401	52206	34476
T.Hard.	2774	7854	1183	6936	1122	6630	13260	5406	9058	3264
Ca^{+2}	555	1469	245	2448	229	1061	2040	979	1550	816
Mg^{+2}	330	1016	139	198	134	967	1983	719	1016	297
T.Alk	960	220	196	194	312	276	216	76	320	352
Cl^{-}	3788	18844	2137	24672	1457	15930	36911	15541	21564	11850
SO_4^{-2}	3361	3512	1192	3795	2993	3692	4380	2927	4446	4210
NO_3-N	5.8	BDL	BDL	BDL	0.27	BDL	BDL	BDL	BDL	BDL
F^{-}	0.63	0.79	0.55	0.06	0.45	0.71	0.58	0.35	0.53	0.62
As	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cu	0.15	0.16	0.24	0.08	0.02	0.06	0.20	0.48	0.11	0.05
Cd	0.02	0.10	0.11	0.09	BDL	0.04	0.23	0.06	0.08	0.05
Cr	0.08	0.23	0.21	0.20	BDL	0.12	0.41	0.15	0.22	0.12
Pb	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	0.016	0.023	0.022	0.019	0.003	0.007	0.034	0.214	0.014	0.007
Zn	1.21	11.92	2.08	0.50	1.79	15.44	3.95	1.94	1.25	1.09

Note: All values are expressed in mg/L. **BDL**- Below detectable limit. BW- Bore Well.

The collected bore well samples are analyzed by CPCB and analysis results revels that:

- The concentration of Copper is in the range of 0.02 to 0.48 mg/l.
- The concentration of Cadmium is in the range of BDL to 0.23 mg/l.
- The concentration of Chromium is in the range of BDL to 0.41 mg/l.
- The concentration of Arsenic & Lead ar BDL in all the samples.
- The concentration of Nickel is in the range of 0.003 to 0.214 mg/l.
- The concentration of Zinc is in the range of 0.5 to 11.54 mg/l.
- The TDS concentration is in the range of 4794 to 64127mg/l.

The huge variations in the TDS concentrations among the samples collected from the peizometric wells may be due to the passing of natural drains adjacent to few peizometric wells.

5.5 LEACHATE SAMPLING

The leachate from the SLFs are being collected in the leachate collection sumps and the collected leachate are collected in tankers and discharged into the collection tanks of ETP for treatment. During the visit, leachate samples were collected from the leachate collection sumps of active SLF (SLF 8A & 8B) and the collected samples was analysed by CPCB to know the characterization of leachate. The details of the leachate sampling carried out during the visit are given below.

S. No.	Sample collected from	
	Sump No.	SLF no.
01.	From Leachate collection Sump no.01	SLF No. 8A
02.	From Leachate collection Sump no.05	SLF No. 8B

The locations of the leachate samples collected from the active SLF during the visit are marked on Google image and given in figure below.

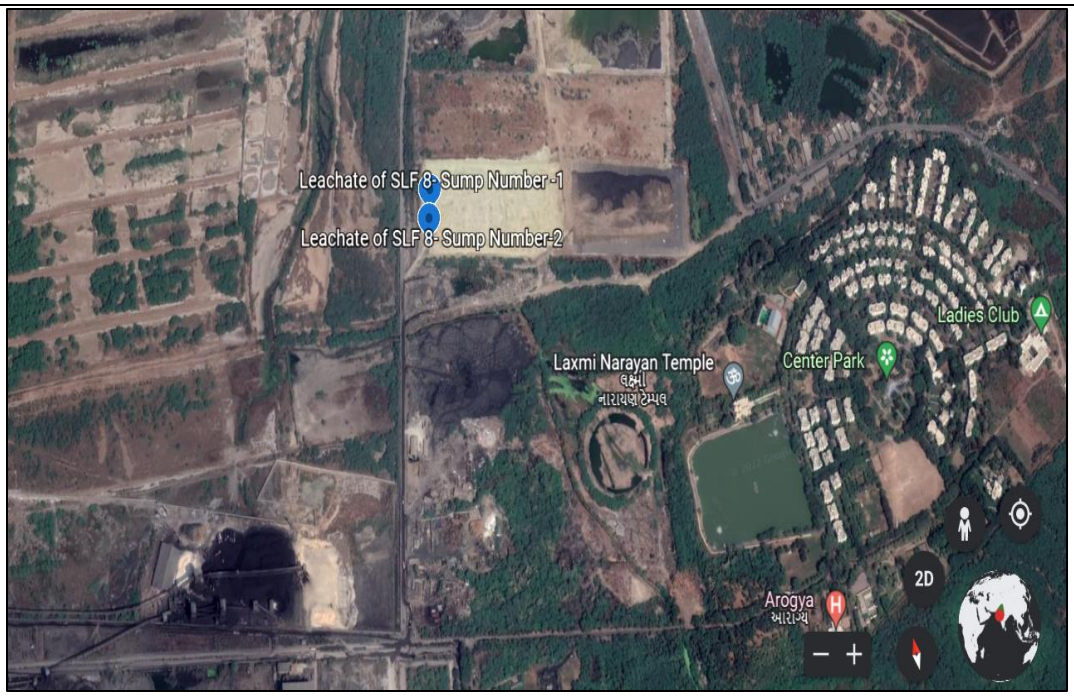


Figure: Locations of leachate sampling from leachate collection sumps of active SLFs marked on image Google

The results of samples collected from leachate collection sumps of active SLFs (SLF- 8 A & 8B) analysed by CPCB are given in below table.

Location	Parameters								
	pH	TSS	TDS	COD	BOD	NH_3-N	Phenols	Cr^{+6}	As
Leachate collection tank (SLF-8A/sump no.1)	7.23	42	6755	22	5.2	2.17	0.192	BDL	BDL
Leachate collection tank (SLF-8B/ sump no.5)	7.38	51	4872	36	18	42.1	0.270	BDL	0.4

The leachate samples collected from the leachate collection sumps attached to active SLFs are analyzed by CPCB and the analysis results reveals that concentration of COD are 22 and 36mg/L in samples collected from sump no.01 & sump no.05 respectively. BOD concentration is 5.2 and 18mg/L in samples collected from sump no.01 & sump no.05 respectively. The concentration of Cr^{+6} are BDL in both the samples. The concentration of Arsenic is BDL in sample collected from sump no.1 and 0.4mg/L in the sample collected from sump no.5. The concentrations of phenolic compounds are 0.192 & 0.270 mg/L in samples from sump no.01 & sump no.05 respectively. The leachate being collected in the leachate collection sumps are further treated in the ETP of the unit.

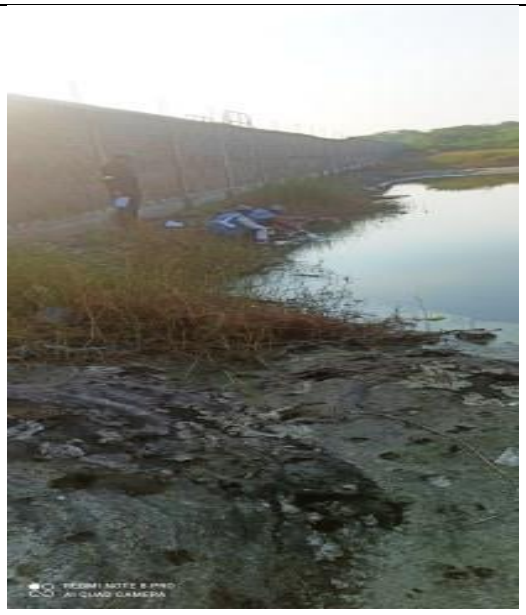
5.6 MONITORING OF WATER PONDING IN RESERVE FOREST

During the visit, water was found stagnant in patches in the low lying reserve forest area located to the North of the factory boundary (north to the 16 Ha industry area). The visiting team collected the ponding water in the reserve forest area at two different locations to assess the probable contamination due to unremoved copper slags by the industry in the said reserve forest area. The samples were collected in presence of representative of Forest Department, Government of Gujarat. The details of the samples collected from the water ponding are given in table below.

S. No.	Sample collected from	
	Description of sample	Location of ponding
Sample - 01	From ponding of water in Reserve forest area	Adjacent to the boundary wall of the industry.
Sample - 02	From ponding of water in Reserve forest area	About 100 m away from the boundary wall of the industry

Photographs taken during sampling of ponding water in the reserve forest area during the visit and photograph showing the boundary wall of the industry are given in Table below.

The stagnant water in reserve forest area outside the northern boundary of the industry



Sampling from shallow ponding in reserve forest area near to boundary wall of industry

Sampling from another shallow ponding in reserve forest area

The water samples collected from the ponding in the reserved forest area was handed over to EP(A) approved laboratory for analysis. The analysis results submitted by the EP(A) approved laboratory are given in the table below.

S. No.	Parameters	Unit	Locations		General standards for discharge of Environmental Pollutants (Effluents) Prescribed in Schedule-VI of The Environment (Protection) Rules, 1986	
			Natural ponding at Location-1 in Reserve forest area	Natural ponding at Location-2 in Reserve forest area	Inland surface water	Marine coastal areas
1.	pH	-	8.316	7.324	5.5 to 9.0	5.5 to 9.0
2.	TDS	mg/L	15624	14317	--	--
3.	Conductivity	µS/cm	16375	16691	--	--
4.	Temperature	°C	26.1	27	--	--
5.	Fluorides	mg/L	1.32	1.36	--	--
6.	Chlorides	mg/L	2371	2316	--	--
7.	Nitrate	mg/L	60	70	--	--
8.	Sulphate	mg/L	6886	6850	--	--
9.	Phosphate	mg/L	7.5	4	--	--
10.	Total Hardness	mg/L	5200	4130	--	--

11.	BOD	mg/L	**140**	**98**	30	100
12.	Colour	Pt/co.	100	30	--	--
13.	COD	mg/L	**396**	**281**	250	250
14.	Oil & Grease	mg/L	4	0.30	10	20
15.	Arsenic	mg/L	BDL	BDL	0.2	0.2
16.	Chromium	mg/L	BDL	BDL	2.0	2.0
17.	Copper	mg/L	2.0	1.4	3.0	3.0
18.	Cadmium	mg/L	0.28	0.61	2.0	2.0
19.	Iron	mg/L	2.0	BDL	3.0	3.0
20.	Lead	mg/L	BDL	BDL	0.1	2.0
21.	Manganese	mg/L	3.2	5.5	2.0	2.0
22.	Molybdenum	mg/L	BDL	BDL	--	--
23.	Mercury	mg/L	BDL	BDL	0.01	0.01
24.	Nickel	mg/L	BDL	0.23	3.0	5.0
25.	Zinc	mg/L	0.61	2.95	5.0	15
26.	Sulphide	mg/L	BDL	BDL	2.0	5.0
27.	Antimony	mg/L	BDL	BDL	--	--
28.	Cobalt	mg/L	BDL	BDL	--	--
29.	Cyanide	mg/L	BDL	BDL	0.2	0.2

The analysis results submitted by the E(P)A approved laboratory reveals that pH values are 8.316 & 7.324 in locations - 1 & 2 respectively. The concentration of Copper, Cadmium Manganese and Zinc are 2.0 & 1.4 mg/L, 0.28 & 0.61 mg/L, 3.2 & 5.5mg/L, 0.61 &2.95 mg/L in location1 & 2 respectively.

The COD concentrations are 396 & 281 mg/L and BOD concentrations are 140 & 98 mg/L in samples collected at locations 1 & 2 respectively. The TDS concentrations are 15624 & 14317mg/L at locations 1 & 2 respectively. The chloride and Sulphate concentrations are 2371 & 2316 mg/L and 6886 & 6850mg/L at locations 1 & 2 respectively.

The concentrations of Arsenic, Chromium, Lead, Molybdenum, Mercury, Sulphide, Antimony, Cobalt, Cyanide in both the samples are BDL.

Though the source of the shallow water ponding in the reserved forest area is mainly rain water, the analysis results of samples collected from the said water ponding are compared with the 'General standards for discharge of environmental pollutants (effluents) in Inland surface water, Land for irrigation & Marine coastal areas'. Most of the monitored parameters are meeting the said standards. However, the concentrations of BOD & COD are high, which may be due to decay of plants & vegetation around the water ponding and also due to the excreta of wild animals in that area which was observed during the visit. The presence of high TDS in the samples are may be due to the salinity of the area because of coastal effect.

5.7 SOIL SAMPLING

During the visit, the soil samples were collected at 7 different locations in the reserved forest area located north to the factory premises and from 1 location inside the factory premises in the 16 Ha land adjacent to the coal yard area to assess the probable contamination of the area due to dumping of copper slag by the industry in the said reserve forest area. Two samples collected from each locations. One sample collected at the depth of 0.5m and another sample collected at a depth of 1.5m from the ground level. The sampling locations were identified by the CPCB & GPCB team depending upon the accessibility of the location and also to cover the 3 orthogonal directions and adopting the sampling protocol for the screening of contaminants wrt contaminated sites (as per the guidelines given in the Reference document on Identification, Inspection and Assessment of Contaminated Sites prepared by CPCB during June 2020 based on Guidance document for assessment and remediation of contaminated sites in India issued by MoEF&CC). The samples were collected in presence of representative of Forest Department, Government of Gujarat.

The locations of the soil samples collected from reserved forest area (Location nos. 01 to 07) and from the factory premises (Location no. 08) are marked on Google image and given in figure below.

Figure: *Locations of soil samples collected from the reserved forest area and within the factory premises marked on image Google*

Photographs taken during soil sampling in the reserve forest area during the visit are given in Table below.

Soil sampling in reserved forest area @ 0.5m depth

Soil sampling in reserved forest area @ 1.5m depth using excavator

Soil sampling in reserved forest area using excavator

The soil samples collected from the reserved forest area and from the factory premises were handed over to E(P)A approved laboratory for analysis of the parameters prescribed in the protocol for identification and assessment of contaminated sites in India. The analysis results submitted by the E (P)A approved laboratory are given in the below tables.

S. No	Parameters	Locations								Dutch intervention values
		Location -1		Location -2		Location -3		Location -4		
		@0.5 m depth	@1.5 m depth	@0.5 m depth	@1.5 m depth	@0.5 m depth	@1.5 m depth	@0.5 m depth	@1.5 m depth	
1.	pH	8.351	8.285	9.025	8.668	8.481	9.297	8.851	9.612	--

2.	Moisture	1.76	1.81	3.06	4.06	1.18	4.89	3.82	6.61	--
3.	Sodium	1152	2260	6030	6940	62.5	3385	557.5	8800	--
4.	Potassium	450	643	500	571	272.5	1620	1440	2940	--
5.	Calcium	4709	5271	6413	5471	4409	4108	5311	3507	--
6.	Cation	35.5	47.2	64.8	87.8	27.9	78.9	58.1	89.0	--
7.	Arsenic	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	55
8.	Antimony	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	15
9.	Chromium	13	29	22	25	17	40	32	48	380
10.	Copper	50	84	96	95	42	84	63	86	190
11.	Cobalt	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	240
12.	Cadmium	BDL	BDL	1.20	1.30	0.56	0.89	BDL	1.05	--
13.	Iron	2.45	3.01	3.21	4.56	3.23	3.75	3.91	3.66	--
14.	Lead	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	530
15.	Manganese	182	652	290	325	482	321	743	423	--
16.	Molybdenum	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	200
17.	Mercury	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
18.	Nickel	34	52	48	45	42	49	42	44	210
19.	Zinc	28	44	48	90	39	55	61	69	720

Note: All units are expressed in mg/Kg except pH. Moisture & Iron are expressed in% and Cations are expressed in neq/100g.

S. No	Parameters	Locations								Dutch intervention values
		Location - 5		Location - 6		Location - 7		Location - 8		
		@0.5m depth	@1.5m depth	@0.5m depth	@1.5m depth	@0.5m depth	@1.5m depth	@0.5m depth	@1.5m depth	
1.	pH	8.914	9.705	9.324	8.81	9.008	9.477	8.272	8.495	--
2.	Moisture	1.46	5.16	5.49	7.95	8.8	6.1	5.95	2.62	--
3.	Sodium	404	2725	5840	15200	10850	8530	2285	2790	--
4.	Potassium	482	1820	2060	2945	2365	2740	1830	1320	--
5.	Calcium	4088	3768	4328	4028	3707	3567	11804	4709	--
6.	Cation	36.8	54.1	72.6	114.1	88.3	73.9	99.2	56.0	--
7.	Arsenic	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	55
8.	Antimony	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	15
9.	Chromium	22	31	37	46	40	28	37	21	380
10	Copper	55	59	89	59	62	60	98	93	190
11	Cobalt	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	240
12	Cadmium	BDL	0.72	BDL	BDL	BDL	0.89	BDL	0.72	--
13	Iron	3.40	4.12	4.39	3.76	3.40	4.33	5.87	3.46	--
14	Lead	BDL	BDL	BDL	BDL	BDL	BDL	15	BDL	530
15	Manganese	890	495	1209	596	488	546	844	612	--
16	Molybdenum	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	200
17	Mercury	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
18	Nickel	41	39	47	41	47	46	56	48	210
19	Zinc	52	42	53	50	44	51	88	67	720

Note: All units are expressed in mg/Kg except pH. Moisture & Iron are expressed in% and Cations are expressed in neq/100g.

The collected soil samples are analyzed by E (P)A approved laboratory and the analysis results reveals that:

- The concentration of Copper in the samples are in the range of 42 to 96 mg/kg.
- The concentrations of Arsenic, Antimony, Cobalt, Lead, Molybdenum and Mercury in all the samples are BDL.
- The concentration of Cadmium in the samples are in the range of BDL to 1.3 mg/kg.
- The concentration of Iron in the samples are in the range of 2.45 to 4.56 %.
- The concentration of Manganese in the samples are in the range of 182 to 1209 mg/kg.
- The concentration of Nickel in the samples are in the range of 34 to 52 mg/kg.
- The concentration of Zinc in the samples are in the range of 28 to 90 mg/kg.

The analysis results are to be compared with screening & response levels/ standards to assess the level of contamination and to draw a conclusion as to whether or not the site should be regarded as contaminated site. Therefore, the analysis results of the soil samples collected during the visit are compared with the Dutch Intervention vales; 2009, one of the commonly used screening/ response levels/ standards. The soil remediation intervention values indicate when the functional properties of the soil for humans, plants and animals is seriously impaired or threatened. They are representative of the level of contamination above which a serious case of soil contamination is deemed to exist. The analysis results of the soil samples for heavy metals are within the intervention value of Dutch Standards.

Similarly, another commonly used screening/ response levels/ standard is Canadian Soil Quality Guidelines framed under CCME (Canadian Council of Ministers of the Environment); 1991; Interim Canadian Environmental quality criteria for contaminated sites. Therefore, the analysis results of the soil samples collected during the visits are also compared with the parameters available with the Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, which shows that the concentrations of copper in few samples are exceeding the Canadian soil quality guidelines. The standard

prescribed for Copper in the Canadian Soil quality guidelines for the Agriculture & Residential land use are 63mg/Kg and for Commercial & Industrial land use are 91mg/Kg. The copper slag presently lying in the sampling area would have attributed to the presence of copper in the soil samples. Therefore, the copper slag lying in the reserved forest areas should be removed on priority.

6.0 OTHER OBSERVATIONS

As per detail furnished by the unit, they have supplied total 79658.95 MT of copper slag to M/s Sterling Port Ltd., Dahej during 2009-11. It is understood that M/s. Sterling Port Ltd. has utilized the purchased copper slag for road construction for their proposed jetty in the past. Further onwards the unit has not supplied any copper slag to M/s. Sterling Port Ltd.

During the present visit, it is observed that the road construction activity of the proposed jetty has been abandoned half-way and mangroves developed densely in either side of the said abandoned road. Photographs taken during the visit showing the abandoned jetty road and the densely grown mangroves on either side of the said road are given in below.

Road constructed for the proposed Jetty of M/s. Sterling Port Ltd. is abandoned half-way

Densely grown mangroves on left side of the abandoned Jetty road

Mangroves on right side of the abandoned Jetty road

The unit has a captive Jetty in the Gulf of Khambhat and an approach road has been constructed from the industry premises to the said Jetty. During the visit, dense mangrove vegetation was seen on either side of the Jetty road in the CRZ area. Photographs taken during the visit, showing densely grown mangroves on either side of the Jetty road is given below.

Photograph showing densely developed mangroves on left side of the Jetty road

Photograph showing densely developed mangroves on right side of the Jetty road

The unit has provided concrete internal roads for internal connectivity in the factory premises. Most of the roads are widened and provided with RCC road with end to end carpeting thereby reducing the fugitive emission from vehicular movement inside the premises. Few photographs taken during the visit showing RCC internal roads are given in table below.

Internal RCC road near coal yard

Internal RCC road with end to end carpeting

RCC road from main gate of the complex to the factory premises

The used oil generation quantity as per the CCA is 50 kL/annum. In the FY-21, the used oil generation as per Form-4 was 142.53 KL which is higher than the CCA quantity. The industry's representative stated that this increase in generation quantity was due to overhauling of transformer and turbine all across the plant which was carried out after many years as a one-time affair.

GPCB Schedule-1 auditor carried out ambient air quality monitoring in the factory premises (near Fuel Pump side of the factory) on 23.01.2021. The monitoring result for PM10 was 105.9 microgram/m^3 against the limit of 100 microgram/m^3. Reportedly, the unit has taken the following steps towards the improvement action to reduce the particulate matter in that area:

- Road side pavement area, vehicle parking area and other open areas are covered with end to end carpeting with RCC.

- Yard side and upliftment related structural construction area site are separated with solid barricade and fencing.
- Reduced manual road sweeping completely from routine schedule and deployed additional sweeping machines.

Solid barricade and fencing for seperating yard area and structural construction area

End-to-end carpeting with RCC roads

The unit has provided covered conveyor belts for conveying coal and other bulk materials from their Jetty to the plant. The unit has provided 3 bag filters at the conveyor junction towers and one bag filter for coal crusher. The unit has provided containment wall around the coal yard and also provided high raised wind screens around the coal yard.

The unit is carrying out dust suppression using mobile mist canon in the coal yard area. Provided garland drain around the coal yard. The unit has provided peripheral sprinklers (34 nos.) and a dry fogger machine in the coal yard. The roads around the coal handling area has been converted to

concrete roads. Photographs of coal yard and its surrounding area taken during the visit are given in table below.

Coal Yard with covered conveyors, transfer towers, containment wall, internal road and wind screen

Bag filters for Transfer Tower and crusher

Wind screens at all the sides of the yard

Coal Yard garland drains all around

Sprinkler system at all the sides of coal yard (34 Nos) and at tripper conveyor system

Mist Canon system for coal discharge

Catcher with wheel washing system at entrance of coal yard

The Unit has installed CAAQM stations at four location in the boundary of their premises. Two stations at predominant up-wind directions and two stations at predominant down-wind directions of the factory premises.

The unit has provided OCEMS (Online Continuous Emission Monitoring System) for the emission stacks. The unit is carrying out calibration to the OCEMS. The details of stack provided with OCEMS and the status of calibration and date of calibration and due date for next calibration as provided by the unit are given in table below.

CALIBRATION REPORT OF ANALYZER

S. NO.	STACK NAME	MEASURING GAS	DATE OF CALIBRATION	NEXT CALIBRATION DUE DATE	CALIBRATION STATUS
1	CPP I CFBC BOILER 35 MW	SOX/NOX	19-Jan-22	18-Apr-22	OK
2	CPP III CFBC BOILER 60 MW	SOX/NOX	19-Jan-22	18-Apr-22	OK
3	STAEM DRYER FOR COPPER CONC	SO2	22-Jan-22	21-Apr-22	OK
4	SULPHURIC ACID Pre HEARET-1	SO2	22-Jan-22	21-Apr-22	OK
5	SCF (BYPASS VENT)	SO2	22-Jan-22	21-Apr-22	OK
6	SULPHURIC ACID Pre HEARET-III	SO2	20-Jan-22	19-Apr-22	OK
7	Dore Furnace of PMR plant	SO2	21-Jul-21	20-Jul-22	OK
8	PMR plant Phase III	SO2	21-Jul-21	20-Jul-22	OK
9	Main Stack Secondary gas scrubber	SO2	20-Jul-21	19-Jul-22	OK
10	Main Stack Slag Cleaning Furnace	SO2	20-Jul-21	19-Jul-22	OK
11	Centralized Scrubbing System Copper III	SO2	18-May-21	17-May-22	OK
12	Sulphuric Acid Plant SAP III	SO2	21-Jul-21	20-Jul-22	OK
13	Shaft Furnace of CCR plant I	SO2	20-Jul-21	19-Jul-22	OK
14	Main Stack Sulphuric Acid Plant I	SO2	20-Jul-21	19-Jul-22	OK

As per the records provided by the unit, the copper slag generation and sales/disposal for the period of Jan-2021 to December 2021 is 672492 MT & 639825 MT respectively. The breakup of sale of copper slag to various end users as provided by the unit is given in below table.

Type of Industry	Quantity sold (Jan to Dec 2021) (in MT)	%
To cement industry as RM	185447	29%
To Ready Mix Cement as aggregate	37821	6%
To Road & Construction	238503	37%
To Abrasive Industry	178054	28%
Total	**639825**	**100**

The source of phosphogypsum generation was PAP plant. The unit has already stopped PAP plant and presently no generation of phosphogypsum sludge. The old stock of phosphogypsum is being sent to cement industries and sent for fertilizer use. Presently, unit has stock of 12,00,000 MT of Phosphogypsum sludge, which is completely covered with HDPE liners. Photograph of phosphogypsum sludge stored in the premises provided with HDPE liner cover is shown in Photograph below.

Phosphogypsum sludge stored inside the premises and fully covered with HDPE liners

The unit has engaged three high volume truck mounted road sweeping machines for cleaning the internal roads. In addition, the unit has deployed nine handy portable mechanized road and floor sweeping machines, all across the plant for proper

housekeeping on daily basis. Photographs of the road sweeping machines and mechanized floor sweeping machines are given in table below.

Truck mounted road sweeping machines

One of the mechanized road sweeping machine being used in coal yard during the visit

The unit is carrying out plantation in the premises for the development of green belt. During the visit, plantation done by the unit recently in the 16Ha land inside the boundary wall was observed. As per the details provided by the unit, Plantation carried out by the unit (photographs) and their rate of survival and coverage area is given in table below.

Sr. No.	Year	Sampling done	Survival	Survival (%)	Coverage (Ha)
1	FY-19	14625	12431	85%	8.78
2	FY-20	9369	7964	85%	5.62
3	FY-21	1676	1425	85%	1.01
4	FY-22	6362	5090	80%	3.82

Plantation done in the premises

Plantation done inside the periphery of boundary wall in the 16Ha land

7.0 CONCLUSION

- The unit was operational during the visit.
- The DAP and H_3PO_4 plants in the industry complex are permanently closed. Reportedly, the unit has decided to dismantle these plants. During the visit, the Cooling towers of H_3PO_4 plant has been dismantled completely.
- The ESP attached to the smelter plant-3 has been replaced completely with new one. The APCM provided with the Smelter Plant-3 including ESP is found in operation during the visit.
- During visit, no abnormal emission from the Smelter plant-3 was observed visually and the stack emission monitoring carried out in stack attached to Smelter plant-3 reveals that the emission from the said stack is within the emission norms prescribed in CCA.

- This industry manufactures pure sulphuric acid in sulphuric acid plant-1 & 3. However, there is no generation of spent sulphuric acid from the industry presently.
- Earlier, the spent acid was generated from PAP plant. Presently, the PAP plant has been stopped permanently and the unit is in the process of dismantling the PAP plant. Therefore presently there is no generation of spent acid.
- During the visit to the SLF area, no over flow of leachate observed from any of the leachate collection tanks provided by the unit with the SLFs. The unit has provided leachate collection system with adequate leachate collection tanks for all the SLFs including SLF-7.
- Previously, discharge of acidic waste water / contaminated water into CRZ area through storm water drain of the industry was observed. During the present visit, all storm water drain within premises as well as outside premises is found dry and there is no flow in the storm water drain of the unit leading to sea/CRZ area.
- Unit has two stage treatment system for treatment of effluent generated from the unit. There are two ETPs for the First stage treatment namely ETP-1 and ETP-2. The First stage treatment system of each ETP consist of Collection tank, Primary Reaction tanks with Lime dosing system, 1st stage Primary Clarifier, 2nd stage precipitation Reaction tanks with lime dosing system, 2nd stage Primary Clarifier, RVDF (for sludge dewatering) followed by common Primary Treated wastewater holding lagoon.
- The partially treated wastewater from the Primary Treated wastewater holding lagoon is taken into Second stage treatment system for further treatment which consists of Equalization tank, Flash Mixer, High speed rate contact clarifier (HRCC), Pressure Sand Filter, Dual Media Filter, Ultra Filtration System, Micro Filter, RO System. The RO permeate is reused in plant while RO reject is discharged into deep sea through own discharge pipeline of the unit.
- During inspection, all treatment sections are found in operation.
- The Unit has recently installed Tertiary Water Recycling Unit (TWRU) consisting of Equalization tank, High speed rate contact clarifier (HRCC), Submerged Ultra

Filtration System, High TDS RO, Mechanical Vapour Recompression (MVR). The purpose of installing this TWRU is to decrease discharge (discharge of RO reject in deep sea) from existing 1000 KL/d to 300 KL/d.

- The installation of Tertiary Water Recycling Unit (TWRU) is completed and the commissioning of the same is awaited. It is understood that the unit has applied for CCA-Amendment for operation of the TWRU to GPCB.
- As per detail provided by the unit, the unit has supplied total 79658.95 MT of copper slag to M/s Sterling Port Ltd., Dahej during 2009-11. It is understood that M/s. Sterling Port Ltd. has utilized the purchased copper slag for road construction for their proposed jetty. During the present visit, it is observed that the road construction activity of the proposed jetty has been abandoned half-way and mangroves developed densely in either side of the said abandoned road.
- Further onwards the unit has not supplied any copper slag to M/s. Sterling Port Ltd.
- Earlier, the industry had dumped copper slag into open area within premises and also in adjacent reserved forest area. The industry has lifted all the copper slag previously dumped in open area within premises. However, copper slag dumped in reserved forest area is still lying there, which should be removed on priority.
- Copper slag which was found dumped earlier in the Reserved Forest area, outside the boundary wall of 16- hectare land of factory premises has not been lifted and still found lying the reserve forest area. Also, shallow ponding of water observed at two locations near to the copper slag dumped area in the said forest area during the visit were observed to have high concentrations of BOD & COD, which may be due to the decay of plants & vegetation around the water ponding and also due to the excreta of wild animals in that area which was observed during the visit.
- Soil samples were collected at various locations during the visit are compared with Dutch Intervention vales-2009, one of the commonly used screening/ response levels/ standards to assess the level of contamination and to draw a conclusion as to whether or not the site should be regarded as contaminated site. The analysis results of the soil samples for heavy metals are within the intervention value of Dutch Standards.

- The analysis results of the soil samples are also compared with Canadian Soil Quality Guidelines, another commonly used screening/ response levels/ standard and observed concentration of copper in few samples are exceeding the Canadian soil quality guidelines prescribed for the Agriculture use, Residential land use, Commercial and Industrial land use. The copper slag present lying in the sampling area would have attributed to the presence of copper in the soil samples. Therefore, the copper slag dumped in the reserved forest areas should be removed on priority.
- It was informed that the unit is following with the Forest Department of Gujarat and requesting permission for lifting the copper slag from the reserved forest area.
- As informed by the unit, the copper slag generated from the industry is non-hazardous and not listed as hazardous waste in the CCA. Further, copper slag is mentioned as granulated slag and listed as by-product in the CCA obtained by the industry from GPCB. The industry has also submitted a CPCB letter mentioning copper slag as non-hazardous waste.
- Dense mangrove is observed at both side of jetty approach road of the industry. Also dense mangrove is observed at both sides of the approach road of the proposed sterling jetty and also dense mangrove is observed in old GMB port area.
- The overall housekeeping in the process plant area and the plant premises is observed satisfactory.

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Annexure-1

Minutes of the Meeting held on 15th February 2022 at 11:30 hrs through video conference under the Chairmanship of Honourable Justice B.C.Patel as per the direction of Honourable National Green Tribunal.

Agenda	To implement direction of Honourable National Green Tribunal issued vide order in the matter of O.A. 70/2021 dated 05/01/2022
Reference	Hon'ble NGT order in the matter of O.A. No. 70/2021 dated 05.01.2022
Date and time	15th February 2022 at 11.30 Hrs

Key Attendees:

1. Dr. Yogesh Kumar, Dy. Director & Scientist C, MOEF&CC.
2. Shri S.Pradeep Raj, Scientist-D, CPCB.
3. Shri Paresh Chaudhry, ACF, Gujarat
4. Dr. Chinmay Ghoroi,Asst. Professor, IIT, Gandhinagar
5. Dr.K.V.George, Sr.Principal Scientist, NEERI, Nagpur
6. Shri Ashok Chauhan, JTO and Under Secretary, GCZMA
7. Shri F.M. Modi, Regional Officer, GPCB, Bharuch

At the outset, honourable members of the committee were apprised of the details submitted by the GPCB as discussed during the meeting held on 01.02.2022.

Deliberation of the data submitted by the unit in Form V was discussed at length and it was noted that the data is bulky and its interpretation with regard to CCA of the unit may take time to arrive at any proper conclusion. Hence, the details submitted by the unit shall be made in excel sheet showing limits prescribed in the consent of the unit accorded by GPCB and details of raw materials consumed, production quantity, water consumption, wastewater generation, fuel consumed, hazardous Waste generation and its disposal as per CCA with names of authorized agencies with their permissions.

Dr.Chinmay Ghoroi mentioned that in case of understanding the data in context to CCA, audit report of the last five years along with compliance of recommendation may be sought from the industrial unit to assess the facts.

Dr.K.V.George recommended to prepare an excel sheet for the data submitted of raw materials, products, fuel consumed, hazardous waste generated in context to the quantity permitted in CCA and actually executed so as to assess the compliance. This will not only give glimpse of overall status but also give facts of the data based on noncompliance observed in past by various statutory agencies and action reported.

The detail pertaining to land use land cover (LDLC) was discussed and Dr. Yogesh Kumar mentioned that a APCCF(Land) has requested Director, BISAG, Gandhinagr to provide satellite imaginary of forest land, compartment No: 596 of village Dahej,Ta:vagra,Dist:Bharuch and will expedite the process to avail the same.

At the outset, Honorable Chairman of the committee enquired RO GPCB to share current compliance status of the industrial unit considering past observations to which it was decided that a joint team of MOEF&CC,CPCB and RO-GPCB will visit the industrial unit in a day or two and will submit a report to the committee within 8 to 10 days along

with analysis report of the samples collected to assess overall compliance status of the unit. Accordingly, Shri S. Pradeep Raj, CPCB opined that sampling of wastewater/ treated wastewater from the ETP/ wastewater treatment plants, any stagnant water in the storm water drain or in premises, piezometric well or any bore well in the premises shall be carried out, observation of stacks and OCEMS status shall be carried out and monitoring of few operational stacks on a random basis on field condition shall be carried out, sampling of soil shall also be carried out during the visit to the industry.

As suggested, the operational status of various units in the industry shall be verified and the compliance status of observations & recommendations made by GPCB during the previous visit shall also be verified during the visit. The status of the storage of hazardous & other waste shall also be verified and shall be reported along with photographs.

In line of above, as the details envisaged by the committee is submitted and availed to all the members, Hon'ble Chairman of the committee asked committee members to prepare questions referring to the details submitted by the unit and GPCB so as to carry out the inspection of the unit by the committee at the earliest.

Conclusion

Honourable Chairman of the committee concluded meeting with the following decisions:

- GPCB will circulate Audit report of last five years of the unit after availing from the industrial unit.
- To meet again on 14th March 2022 at 11.30 Hrs. through video conference.

The meeting was concluded with vote of thanks to the Chair.

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Annexure-2

GPCB

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector 10-A, Gandhinagar 382 010
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb.gov.in

By R.P.A.D

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution) Act-1981 and Authorization under "Hazardous Waste (Management, Handling & Trans-boundary Movement) Rule-2008."

And whereas Board has received consolidated application dated 03/03/2014 for the consolidated consent and authorization (CC & A) of this Board under the provisions / rules of the aforesaid Acts Consents and Authorization is hereby granted as under.

CONSENT AND AUTHORIZATOIN:
(Under the provisions / rules of the aforesaid environment acts)

To,
M/s. HINDALCO INDUSTRIES LTD.
AT & PO DAHEJ, LAKHIGAM,
TAL. VAGRA,
DIST: BHARUCH.

1. **Consent Order No. : AWH-62117**
2. The consent under Water Act – 1974 shall be valid up to **02/3/2019** for the use of outlet for the discharge of treated effluent & The consent under Air Act – 1981, Authorization under Environment (Protection) Act, 1986 shall be valid up to **02/03/2019** to operate industrial plant for manufacture of the following products :

Sr.No.	Name of Products	Quantity (TPA)
1.	Cathode Copper	500000
2.	Sulfuric Acid (98.4%)	1470000
3.	Oxygen (Tech)	65000 (TPM)
4.	Gold	26
5.	Silver	200
6.	CC Rod	240000
7.	Phosphoric Acid (as P_2O_5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60

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Name of By-Products		
1.	Selenium	60 TPM
2.	PGM concentrate	0.0508 TPM
3.	Granulated slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	HydroFluosilic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

3. The unit shall have to strictly adhere to the undertaking No.2242 dated 02/08/2004 & No.2243 dated 07/08/2004 submitted for their Copper Smelter plant under various Acts/ Rules.

4. All the conditions stipulated by the Ministry while according environment clearance to the existing project vide its letters No.J-11011/07/94-IAII(I) dated 14th March, 1995; No.J-11011/81/2000-IAII(I) dtd.08/01/2002, No.J-11011/86/2002-IAII(I) dtd 10/02/2004 and J-11011-927/2008-IA-II(I) dated 11/02/2009 should be strictly implemented.

5. **CONDITION UNDER THE WATER ACT:-**

The quantity of total waste water generated shall not exceed **5121 KL/Day** (break up as below):

a) Domestic – **406 KL/Day**

b) Industrial – **4715 KL/Day (Including R.O. reject 1000 KL/day)**

6. **TRADE EFFLUENT:-**

6.1 The industrial effluent shall conform to the following standards :

PARAMETERS	PERMISSIBLE LIMIT
pH	5.5 to 9
Temperature	45 °C
Colour (Pt. Co. scale)	100 units
Total suspended solids	100 mg/l
BOD (3 days at 27 °C)	100 mg/l
COD	250 mg/l
Oil and Grease	20 mg/l
Phenolic Compounds	5 mg/l
Ammonical Nitrogen	50 mg/l

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Sulphides	5 mg/l
Cyanides	0.2 mg/l
Fluorides	10 mg/l
Hexavelent Chromium	1 mg/l
Total Chromium	2.0 mg/l
Copper	3 mg/l
Nickel	5 mg/l
Zinc	15 mg/l
Mercury	0.01 mg/l
Lead	1 mg/l
Arsenic	0.2 mg/l
Cadmium	2 mg/l
Insecticide / Pesticide	Absent
Selenium	0.05 mg/l
Bio-Assay test	90% Survival of fish after 96 hours in 100% effluent.

6.2 "The treated effluent conforming to the above standards shall be reutilized as per specific condition no. (III) of Environment Clearance Certificate dated 18/03/2005 i.e. unit shall use 1330 M3/Day of treated effluent for greenbelt development, 475 M3/Day of treated effluent for lime slurry preparation, 480 M3/Day of treated effluent for make up in slag granulation and remaining 370 M3/Day of treated effluent in gas cleaning section. However, additional treated effluent or during the rainy season, effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO specifically for the effluent generated from copper smelter plant I & II. There shall not be any discharge outside the premises for the effluent generated from copper smelter plant III. The treated effluent should conform to the marine environmental standards, as specified above. The quantity of total waste water generated shall not exceed 5121 KL/day which includes 406 KL/day domestic and 4715 KL/day industrial (including 1000 KL/day RO Reject).

6.3 The sewage from the entire complex shall be treated separately to conform to the following standards and utilized on land for gardening and plantation only.

BOD (5 days at 20 °C)	Less than 20 mg/l
Suspended Solids	Less than 30 mg/l
Residual Chlorine	Minimum 0.5 ppm

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6.4 The company should operate a separate online Fish pond using treated effluent to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to the Ministry's Regional office at Bhopal / CPCB / GPCB.

6.5 Adequate facilities and safety measures including protective clothing for personnel working in the critical area, e.g. in the anode casting area must be strictly explored.

7. CONDITIONS UNDER THE AIR ACT:-

7.1 The following shall be used as fuel in Boiler / furnace / heater.

DETAILS OF FUEL CONSUMPTION		
Sr No	Detail of fuel	TPM
1	Naphtha	3504
2	HSD	900
3	HFO	3959
4	Imported Coal	36980
5	Propane	5616
6	LNG (SCM)	1486197

Phase-I &II	PLANT	NAME OF FUEL	QUANTITY
Boiler	Super heater for WHB of Copper Smelter-II plant	Naphtha	600 Kg/Hr
Heater	Pre-heater in H2SO4 Plant	Naphtha	1.0 T/Hr
Furnace	Smelting furnace (F-1) of Smelter II Plant	HFO	0.5 T/Hr
	Converting Furnace (F-3) of Smelter II Plant	Naphtha HFO	0.3 T/Hr 0.1 T/Hr
	Anode Furnace of Smelter II Plant	Naphtha Propane	0.4 T/Hr 1.0 T/Hr
	PMR Plant	Propane	0.075 T/Hr
Phase-III			
	Sulphuric Acid Plant-III	Naphtha	1.5 T/Hr
	Captive Power Plant	Imported Coal	31.6 T/Hr
	Copper Scrap Melting Furnace	LNG	5400 SCM/day

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7.2 The applicant shall install & operate a comprehensive adequate air pollution in order to achieve prescribe norms control system so as to achieve standards.

7.2.1 The flue emission through stack attached to boiler / furnace / heater / shall conform to the following standards.

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1)	Dore Furnace of PMR Plant	45	Bag Filter	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
2)	Package Boiler	43	Scrubber	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
3)	Sulphuric Acid Pre Heater-I	30	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
4)	Sulphuric Acid Pre Heater-II	30	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
5)	D.G. Set-I	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
6)	D.G. Set-II	30	Cyclone Separator	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
7)	Captive Power Plant (CPP-1) CFBC Boiler 35 MW	75	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
8)	Shaft Furnace of CCR plant-I	26	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm

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9)	Shaft Furnace of CCR plant-II	26	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
10)	Sulphuric Acid Pre Heater-III	38	-	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
11)	Captive Power Plant (CPP-II) AFBC Boiler 15.34 MW	60	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
12)	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP	SPM SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm

7.2.2 The process emission through various stacks / vent of reactors, process, vessel shall conform to the following standards :

STACK NO.	STACK ATTACHED TO	STACK HEIGHT IN METER	AIR POLLUTION CONTROL SYSTEM	PARAMETER	PERMISSIBLE LIMITS
1	Anode Casting	20	-	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3
2	Main Stack Secondary Gas Scrubber	75	Two stage alkali Scrubber	SO2	40 mg/Nm3
3	Copper Scrap Melting Furnace (Cap. 50 TPD)				
4	Main Stack Slag cleaning Furnace	75	Bag Filter	SO2 SPM	40 mg/Nm3 150 mg/Nm3

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5	Main Stack Sulphuric Acid plant I	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2 Kg per ton of 100 % conc. Sulphuric acid
6	Cathode Stripping M/C plant-I	20	-	SO2	40 mg/Nm3
7	Anode scrap washing M/C	20	-	SO2	40 mg/Nm3
8	Liberator Stack	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
9	Slag Granulation	45	-	SPM	150 mg/Nm3
10	Steam Dryer for copper concentrate.	58	Bag Filter	SPM SO2	150 mg/Nm3 40 mg/Nm3
11	Slag Cleaning furnace (By pass Vent)	46	Bag Filter	SPM SO2	150 mg/Nm3 40 mg/Nm3
12	Smelter-II Scrubber	75	Alkalis Scrubber	SO2	40 mg/Nm3
13	Cathode Stripping M/C plant-II	20	-	SO2	40 mg/Nm3
14	Centralized Scrubbing System Cu-III	75	Bag Filter +alkali Scrubber	SPM SO2	150 mg/Nm3 40 mg/Nm3
15	Sulfuric Acid Plant SAP-III	75	5 Stage DCDA, Mist Eliminator +Scrubber	SO2 Acid Mist	1 kg per ton of 100 % conc. Sulphuric acid 25 mg/Nm3
16	Cathode Stripping Refinery-III	20	-	SO2	40 mg/Nm3
17	Main Stack Sulphuric Acid plant II	75	5 Stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2 Kg per ton of 100 % conc. Sulphuric acid
18	Coal Feeder	34	Bag Filter	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3

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19	DAP Plant	60	Dual media scrubber	SPM SO2 NOx NH3 HF	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3 175 mg/Nm3 6 mg/Nm3
20	PS Converter Area (Gases are to be transferred to H2SO4 plant) only emergency vent	47	-	SPM SO2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg/Nm3
21	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6 mg/Nm3
22	PMR Plant Phase-III	30	Bag Filter	SPM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg/Nm3

NOTE : Total Lead/Zinc/Copper in the gaseous emission shall not exceed 20 mg/Nm3.

7.2.3 Ambient air quality within the premises of the industry shall conform to the following Standards:

PARAMETER	PERMISSIBLE LIMIT
Suspended Particulate Matter (size less than 10um)or PM10 µg/m3**	100 microgram per cubic meter
Suspended Particulate Matter (size less than 2.5 um)or PM2.5 µg/m3**	60 microgram per cubic meter
Oxides Of Sulphur**	80 microgram per cubic meter
Oxides Of Nitrogen**	80 microgram per cubic meter
HCL	200 microgram per cubic meter
Cl_2	100 microgram per cubic meter
H2S	500 microgram per cubic meter
Ammonia	400 microgram per cubic meter
HF	60 microgram per cubic meter
CO	5000 microgram per cubic meter

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** 24 Hourly or 08 hourly or 01 Hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time; they may exceed the limits but not on two consecutive days of monitoring.

Note: - Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

7.2.4 The applicant shall operate industrial plant / air pollution control equipment very efficiently and continuously so that the gaseous emission always conforms to the standards specified in condition no.7.2.1 and 7.2.2 & 7.2.3 above.

7.2.5 The consent to operate the industrial plant shall lapse if at any time parameters of the gaseous emission are not within the tolerance limits specified in the condition no.7.2.1 and 7.2.2 & 7.2.3 above.

7.3 The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

7.4 The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. to 6 a.m.

8. GENERAL CONDITIONS:-

8.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

8.2 Applicant shall also comply with the general conditions given in annexure I.

8.3 Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Court's order in W.P.No.657 of 1995 dated 14th October 2003.

8.4 Industry shall have to display on-line data outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant including waste water and air emissions and solid hazardous waste generated within the factory premises.

8.5 The unit shall strictly comply with the rules & regulations under manufacture, storage & import of Hazardous Chemicals Rules-1989 as amended in October, 1994 & January-2000.

9. AUTHORIZATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 3 (c) & 5 (5)).

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Form for grant authorization for occupier or operator for handling hazardous waste.

9.1 Number of authorization : **AWH-62117.**

9.2 M/s. HINDALCO INDUSTRIES LTD is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT AT & PO DAHEJ, LAKHIGAM, TAL. VAGRA, DIST. BHARUCH.**

Sr. No.	Waste	Quantity	Schedule	Mode of Disposal
1	ETP waste sludge & Scrubber waste	175095 TPA	7.5 / I	Collection, Storage, transportation and disposed at Own SLF site.
2	Arsenic bearing sludge, As-Cu precipitate	270.80 TPA	7.3 / I	Collection in closed stainless steel vessel, recycle & treatment/ encapsulation & disposed at own SLF site.
3	Used oil	35 Kl/Yr	5.1 / I	Collection, storage, transportation and disposal by sale to registered re-refiner.
4	Spent electrolyte solution	52560 Kl/yr	8.1 / I	Collection, Storage, Treatment in inhouse ETP.
5	Residue/ dust from SAP	12 TPA	17.1 / I	Collection, storage, transportation and recycle into process.
6	Spent catalyst	29 Kl/yr	17.2 / I	Collection, storage, transportation and reuse into process OR treatment/ disposal at own SLF site.
7	Used empty drums	780 No/yr	33.3 / I	Collection, storage, cleaning, transportation and disposal by sale to traders.
8	Flue gas cleaning residue	864 TPA	34.1 / I	Collection, storage, transportation and recycle into process.
9	Spent resin from DM plant	7.5 Kl/yr	34.2 / I	Collection, Storage, transportation and disposed at Own SLF site.

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10	Selenium & Selenium compound	6 TPA	A-7/ II	Collection, Storage, transportation & disposal by sale to actual users.
11	Silver compound	6 TPA	B-10 / II	Collection, Storage, transportation & disposal by sale to actual users.
12	Inorganic acid	66960 TPA	D2 / II	Collection, Storage, transportation and reuse to Mfg of AlF3/ disposal by sale to actual users.

9.3 Unit shall manage the waste as per the condition stipulated in Environmental Clearance certificate, issued by MoEF, Government of India.

9.4 Unit shall manage the Copper residue waste as per circular of CPCB.

9.5 Unit shall manage the copper-arsenic waste properly by providing storage in close stainless steel vessel before recycling.

9.6 Unit shall close the cell (TSDF) in operation as per guidelines of CPCB.

9.7 Unit shall submit time-bound action plan for minimization & reuse in accordance of Hazardous Waste rules.

9.8 Unit shall have to strictly comply with an undertaking no. **2243** dtd.**07/08/2004**.

9.9 The authorization is granted to operate a facility for collection, storage, reuse, treatment of Hazardous wastes at factory premises, transportation and disposal to Captive TSDF.

9.10 The authorization shall be in force for a period up to **dated 02/03/2019**.

9.11 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

9.12 The Collection, storage, transportation and disposal of lead batteries shall be under Batteries (Management and Handling) Rules, 2001.

9.13 **TERMS AND CONDITIONS OF AUTHORIZATION**

9.13.1 The applicant shall comply with the provisions of the Environmental (Protection) Act – 1986 and the rules made there under.

9.13.2 The authorization shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

9.13.3 The persons authorized shall not rent, lend, sell, transfer of otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.

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9.13.4 Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a breach of this authorization.

9.13.5 It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.

For and on behalf of
Gujarat Pollution control Board

(R.R.Vyas)
Environmental Engineer

NO.GPCB/BRCH-B-CCA-310 (11)/15178 216033 Dt. 11/06/2014

ISSUED TO:
M/s. HINDALCO INDUSTRIES LTD. (BIRLA COPPER),
AT & PO DAHEJ, LAKHIGAM,
TAL. VAGRA,
DIST.BHARUCH

1700

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 021.
Website : www.gpcb.gov.in

GPCB

BY.R.P.A.D

NO:-GPCB/BRCH/ B-CCA-310(12)/ID-15178/ 227652 **/Dated:** 07/10/2014

Amendment to CONSENTS AND AUTHORISATION Order No:- AHW- **62117** dated **11/06/2014.**
(Under the provisions /rules of the aforesaid environmental acts)

TO.
HINDALCO INDUSTRIES LIMITED (UNIT: BIRLA COPPER)
AT & PO DAHEJ, LAKHIGAM,
TAL: VAGRA, DIST: BHARUCH.

In exercise of the power conferred by clause (b) of sub-section (4) of Section 25 of the Water (Prevention & Control of Pollution) Act, 1974 and sub-section (4) of Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and rule 6 of Hazardous Waste (Management Handling & Trans-boundary Movement) Rules 2008, framed under Environment (Protection) Act, 1986. The Consolidated Consent and Authorization (CC & A) vide this office Consent order no: **AWH-62117 dated 11/06/2014** is being subjected to amendment for the following conditions only.

AND WHEREAS Board has received your letter dated **28/07/2014** for the amendment (expansion of validity) of **Consolidated Consent and Authorization** (CC & A) of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby amended as under subjected to amendment for the following conditions only.

1. The validity mentioned in the condition No. 2 of the order is amended as **02/03/2020** in place of **02/03/2019.**
2. The other conditions of the CCA order no. **AWH-62117 dated 11/06/2014** shall remain unchanged.

For and on behalf of
GUJARAT POLLUTION CONTRO BOARD

(M.V.Patel)
Environmental Engineer

GPCB

GUJARAT POLLUTION CONTROL BOARD

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By R.P.A.D.

CONSOLIDATED CONSENT AND AUTHORIZATION(CC & A)
CCA NO: AWH- 108216

NO: GPCB/BRCH/CCA-310(19)/ID-15178/ _____ **DT: ___/09/2020**

In exercise of the power conferred underSection-25of the Water (Prevention and Control of Pollution)Act-1974, under Section-21 of the Air (Prevention and Control of Pollution)Act-1981 and Authorization under rule 6(2) of the Hazardous & Other Wastes (Management and Trans boundary Movement) Rules-2016, framed under the E(P)Act-1986.

And whereas Board has received consolidated application dated **30/01/2020** and inward no. **171166** for the consolidated consent and authorization (CC & A)of this Board under the provisions / rules of the aforesaid Acts, Consolidated Consent & Authorization is hereby granted as under.

CONSOLIDATED CONSENT AND AUTHORISATION:
(Under the provisions / rules of the aforesaid Environmental Acts)

To,
M/s. HINDALCO INDUSTRIES LTD.,
PLOT NO: 2,10,11,43,
AT & POST DAHEJ, LAKHIGAM
TAL: VAGRA, GIDC ESTATE DAHEJ,
DIST-BHARUCH.

1. **Consent Order No. : AWH-108216 date of Issue 30/05/2020.**
2. The consent under Water Act-1974 for conveying the industrial treated effluent discharge to deep sea, The consent under Air Act-1981 & Authorization under Environment (Protection) Act, 1986 shall be **valid up to 02/03/2026** to operate industrial plant to manufacture following products:

Sr. No.	Products	Quantity(MT/Annum)
1.	Copper Cathode	500000
2.	Sulphuric Acid (98.4 %)	1470000
3.	Oxygen (Tech)	780000
4.	Gold	26
5.	Silver	200
6.	CC Rod	484000
7.	Phosphoric Acid (as P2O5)	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.60
10.	Copper Wire (≤4 mm dia) through Mechanical Drawing Process.	60000

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Sr No.	Name of By-Product	Quantity
1.	Selenium	60 TPM
2.	PGM Concentrate	0.0508 TPM
3.	Granulated Slag	65500 TPM
4.	Phosphogypsum	150000 TPM
5.	Hydrofluosilic acid	5580 TPM
6.	Aluminium Fluoride	500 TPM

Specific conditions:

a) Unit shall comply with all the conditions stipulated by SEIAA / MoEF in the order of Environment Clearance issued vide letter No.J-11011/07/94-IAII(I) dated 14/03/1995 No.J-11011/81/2000-IAII (I) dated 08/01/2002, No.J-11011/86/2002-IAII (I) dated 10/02/2004, No.J-11011/220/2002-IAII (I) dated 18/03/2005, No. J-11011-927/2008-IA-II (I) dated11/02/2009 and No. J-11011-927/2008- IA-II (I) dated.23/02/2017.

b) Unit shall sell out their hazardous waste to authorized end users who is having authorization with valid CCA and rule 9 permission to receive this waste. Unit shall make MoU with such authorized end users and submit MoU.

c) All the efforts shall be made to send hazardous waste to cement industry for Co-processing first & there after it shall be disposed through other option.

d) Unit shall follow coal handling guideline framed by Board and provide close ash handling facility.

e) Unit shall strictly follow the Fly Ash Notification for disposal of generated ash.

f) Unit shall install online Continuous Emission Monitoring Systems (CEMS) and link it with the server of GPCB for real time data transfer for boiler more than 8 TPH capacity or equivalent capacity of TFH.

3. CONDITION UNDER THE WATER ACT:

3.1 The quantity of total water consumption shall not exceed **39742 KL/Day** as per below break up as mentioned in form D submitted for consent application under the Water Act- 1974.

a) Industrial: **38524** KL/Day
b) Domestic: **1218** KL/Day

3.2 The quantity of total waste water generation shall not exceed **5161 KL/DAY** as per below break up as mentioned in form D submitted for consent application under the Water Act- 1974.

a) Industrial: **4755** KL/Day (Including R.O reject 1000 KL/day)
b) Domestic: **406** KL/Day

3.3 Mode of disposal of wastewater:

a) The treated effluent conforming to the standards as per condition no. 3.4 shall be reutilized as per specific condition no. (III) of Environment Clearance Certificate

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dated: 18/03/2005 i.e. unit shall use 1330 M3/Day of treated effluent for greenbelt development. 475 M3/Day of treated effluent for lime slurry preparation. 480 M3/Day of treated effluent for make up in slag granulation and remaining 370 M3/Day of treated effluent in gas cleaning section. However, additional treated effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO specifically for the effluent generated from copper smelter Plant I & II. There shall not be any discharge outside the premises for the effluent generated from copper smelter Plant-III. The treated effluent should conform to the marine environmental standards as specified as per condition no. 3.4.

b) The Sewage from the entire complex shall be treated separately to conform to the following and utilized on land for gardening and plantation only.

Sr. No.	PARAMETERS	PERMISSIBLE LIMIT
1	Biochemical Oxygen Demand, BOD_3, 27° C	20 mg/L
2	Total Suspended Solids (TSS)	30 mg/L
3	Total Residual Chlorine	Minimum 0.5 ppm

c) The company should operate a separate online Fish pond using treated effluent to ensure that the quality of treated effluent discharged into the sea does not have any adverse impact on the marine life. The effluent quality at the marine discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to the Ministry's Regional office at Bhopal/CPCB/GPCB.

d) Adequate facilities and safety measures including protective clothing for personnel working in the critical area. e.g. in the anode casting area must be strictly explored.

3.4 The quality of industrial effluent shall conform to the following standards (as per GPCB norms, whichever is applicable) (additional treated effluent shall be discharged into the deep sea through HDPE pipeline at a point through multiple diffuser system as recommended by the NIO)

Sr. No.	PARAMETERS	PERMISSIBLE LIMIT
1	pH	5.5-9.0
2	Temperature	45°C
3	Colour(Pt,Co.scale)	100 units
4	Total suspended solids	100 mg/l
5	BOD(3 days at 27o C)	100 mg/l
6	COD	250 mg/l
7	Oil and Grease	20 mg/l
8	Phenolic Compounds	5 mg/l
9	Ammonical Nitrogen	50 mg/l
10	Sulphides	5 mg/l
11	Cyanides	0.2 mg/l
12	Fluoride	10 mg/l
13	Hexavalent Chromium	1.0 mg/l
14	Total Chromium	2.0 mg/l
15	Copper	3.0 mg/l

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16	Nickel	5.0 mg/l
17	Zinc	15.0 mg/l
18	Mercury	0.01 mg/l
19	Lead	1.0 mg/l
20	Arsenic	0.2 mg/l
21	Cadmium	2.0 mg/l
22	Insecticide/Pesticide	Absent
23	Selenium	0.05 mg/l
24	Bio-Assay Test	90 % survival of fish after 96 hours in 100 % effluent

3.5 The treated effluent conforming to the above standards shall be reutilized in the process.

3.6 Unit shall implement & follow communication plan so that respected work can be done in minimum response time in case of emergencies.

3.7 Unit shall install continuous / online monitoring system and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as pH, BOD,COD, TSS, other sector specific parameters etc. with recorder & magnetic flow meters for flow measurement of treated wastewater as per CPCB guideline.

3.8 Unit shall make fixed arrangement for discharge of the effluent from their Final collection tanks. Unit shall not keep any by-pass line or system or loose or flexible pipe line for discharge of the effluent into underground drainage network of Pipeline.

3.9 Magnetic flow meters shall be installed at the inlet & outlet of effluent collection tanks/ETP to measure the quantity of effluent.

3.10 Unit shall affix of water meters as per Section 4 (1) of the water (Prevention and Control of Pollution) Cess Act - 1977 for the purpose of measuring and recording the quantity of water consumed at such places as may be required.

3.11 Unit shall provide adequate / safe effluent sampling facility for the effluent being stored in final collection / discharge tank of ETP.

3.12 Unit shall put up at the entrance a board displaying the name of unit, particulars of the products/ process, the name of proprietor/partners /directors of the unit.

3.13 Unit shall have to display on-line data outside the main factory gate with regard to and nature of hazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises, if applicable as per CPCB norms.

3.14 Unit shall either stop or curtail its production activities if the effluent is not conforming to the standards of GPCB.

3.15 Unit shall keep accurate records of quantity of production of each product, quantity of water consumption, quantity of effluent generated and consumption of electricity

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on day to day basis and required to submit the complied record of each month to GPCB on or before fifth day of the succeeding month.

3.16 Disposal system for storm water shall be provided separately. In no circumstances storm water shall be mixed with the industrial effluent.

3.17 Leachate from the Secured Land Fill, if any shall alsobe connected into a collection tank through leachate collection facilities and shall be treated along with industrial effluent.

3.18 The Environmental Management Unit/Cell shall be setup to ensure implementation on and monitoring of environment safeguards and other conditions stipulated by statutory authorities. The Environmental Management Cell / Unit shall directly report to the Chief Executive of the organization and shall work as a focal point for internalizing environmental issued. These Cells also coordinate the exercise of environmental audit and preparation of environmental statements.

3.19 The Environmental audit shall be carryout yearly, if applicable. The environmental statements pertaining to the previous year shall be submitting to this State Board latest by 30th September every year.

3.20 In case of change of ownership/ management the name and address of, the new ownership/ partners/ directors/ proprietor should immediately be intimate to the Board. Also any change in equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

3.21 The Board reserves the right to review and/or revoke the consent and / or make modifications in the conditions which it seems fit in accordance with provisions of Water Act-1974.

4. CONDITIONS UNDER THE AIR ACT:

4.1 The following shall be used as fuel:

Sr. No.	Name of fuel	Quantity in TPM
1.	HSD	900
2.	HFO	1530
3.	Imported Coal	36980
4.	LNG(SCM)	1486197

4.1.1 The flue gas emission through stack shall conform to the following standards:

Stack No.	Stack attached to	Stack Height in Meter (From G.L.)	Air Pollution Control Measure (APCM)	Parameter	Permissible limit
1.	Dore furnace of PMR Plant	45	Bag Filter	PM SO2 NOx	150 mg/Nm³ 100 ppm 50 ppm

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2.	Package boiler	43	Scrubber	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
3.	Sulphuric Acid Preheater -I	30	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
4.	Sulphuric Acid Preheater -II	30	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
5.	DG Set –I	30	Cyclone Separator	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
6.	DG Sets-II	30	Cyclone Separator	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
7.	Captive Power Plant (CPP-I) CFBC Boiler 35 MW	75	ESP + lime dosing system	PM SO2 NOx	100 mg/Nm^3 600 mg/Nm^3 600 mg/Nm^3
8.	Shaft Furnace of CCR Plant-I	26	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
9.	Shaft Furnace of CCR Plant-II	26	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
10.	Sulphuric Acid Preheater -III	38	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm
11.	Captive Power Plant (CPP-II) AFBC Boiler 15.34 MW	60	ESP + lime dosing system	PM SO2 NOx	100 mg/Nm^3 600 mg/Nm^3 600 mg/Nm^3
12.	Captive Power Plant (CPP-III) CFBC Boiler 60 MW	85	ESP + lime dosing system	PM SO2 NOx Mercury	50 mg/Nm3 600 mg/Nm^3 300 mg/Nm^3 0.03 mg/NM^3
13.	Shaft Furnace of CCR Plant-III	35	--	PM SO2 NOx	150 mg/Nm^3 100 ppm 50 ppm

4.2 The Process emission through various stacks/ vent of reactors, process, vessel shall conform to the following standards:

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Stack No.	Stack attached to	Stack Height in Meter (From G.L.)	Air Pollution Control Measure (APCM)	Parameter	Permissible limit
1.	Anode Casting of Smelter-I	20	--	PM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3
2.	Main stack Secondary Gas Scrubber of Smelter-I	75	Two stage alkali Scrubber	SO2	40 mg/Nm3
3.	Copper scrap melting furnace (Cap,50 TPD) of Smelter-I				
4.	Main stack Slag Cleaning Furnace of Smelter-I	75	Bag filter	PM SO2	150 mg/Nm3 40 mg/ Nm3
5.	Main Stack Sulphuric Acid Plant-I	75	5 stage DCDA system & Mist Eliminator	Acid Mist SO2	25 mg/Nm3 2.0 Kg per Ton of 100 % conc. Sulphuric Acid
6.	Cathode Stripping M/C Plant-I of Refinery-I	20	--	SO2	40 mg/Nm3
7.	Anode scrap Washing M/C of Refinery-I	20	--	SO2	40 mg/Nm3
8.	Liberator Stack of Refinery-I	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
9.	Slag Granulation of Smelter-I	45	--	SPM	150 mg/Nm3
10.	Steam Dryer of Copper concentrate of Smelter-I	58	Bag Filter	PM SO2	150 mg/Nm3 40 mg/ Nm3
11.	Slag Cleaning Furnace (By Pass vent) of Smelter-I	46	Bag Filter	PM SO2	150 mg/Nm3 40 mg/ Nm3

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12.	Cathode Stripping M/C Plant-II of Refinery-II	20	--	SO2	40 mg/Nm3
13.	Centralized Scrubbing System Smelter-III	75	Bag Filter + Alkali Scrubber	PM SO2	150 mg/Nm3 40 mg/ Nm3
14.	Sulphuric Acid Plant-III	75	5 stage DCDA system & Mist Eliminator Tail Gas Scrubber based on Dynawave scrubber	Acid Mist SO2	25 mg/Nm3 1.0 Kg per Ton of 100 % conc. Sulphuric Acid
15.	Cathode Stripping M/C Refinery-III	20	--	SO2	40 mg/Nm3
16.	Liberator Stack of Refinery-III	26	Scrubber	SO2 Acid Mist	40 mg/Nm3 25 mg/Nm3
17.	DAP	60	Dual media Scrubber	PM SO2 NOx NH3 HF	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3 175 mg/Nm3 6.0 mg / Nm3
18.	PS Convertor area (Gases are to be transferred to H2SO4 plant) only emergency vent	47	--	PM SO2 Copper	150 mg/Nm3 40 mg/Nm3 20 mg / Nm3
19.	Reactor (Phosphoric Acid Plant)	60	Scrubber	HF	6.0 mg/ Nm3
20.	PMR Plant Phase -III	30	Bag Filter	PM SO2 NOx	150 mg/Nm3 40 mg/Nm3 25 mg / Nm3

4.3 The concentration of the following parameters in the ambient air within the premises of the unit shall not exceed the limits specified hereunder.

Sr. No.	Parameters	Permissible Limit (microgram /m³)	
		Annual	24 Hours Average
1.	Particulate Matter (PM_{10})	60	100
2.	Particulate Matter ($PM_{2.5}$)	40	60
3.	Oxides of Sulphur (SO_x)	50	80
4.	Oxides of Nitrogen (NO_x)	40	80

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- **Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.**
- **24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.**

4.4 Unit shall operate industrial plant / air pollution control equipment very efficiently and continuously so that the gaseous emission always conforms to the standards specified as above.

4.5 The consent to operate the industrial plant shall lapse if at any time the parameters of the gaseous emission are not within the tolerance limits specified as above.

4.6 Unit shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

4.7 Unit shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB(a) during day time and 70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.

4.8 All efforts shall be made to control VOC emissions and odor problem, if any.

4.9 Total control of odor nuisance from the plant premises, shall be achieved & maintained by the unit continuously

4.10 Unit shall install continuous / online monitoring system in the stacks and shall transmit online data so generated simultaneously to GPCB and CPCB as well for the parameters such as PM, SO2, NOx, other sector specific parameters etc., if applicable as per CPCB guideline.

5 GENERAL CONDITIONS: -

5.1 In case of change of ownership/ management the name and address of the new ownership/ partners/ directors/ proprietor should immediately be intimate to the Board. Also any change in equipment or working conditions as mentioned in the consents form/ order should immediately be intimated to this Board.

5.2 Unit shall put up at the entrance a board displaying the name of unit, particulars of the products/ process and the name of proprietor/partners /directors of the unit and the electricity consumer number as on the record of DGVCL.

6. AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 6(2)).

6.1 Number of authorization: **AWH-108216 date of Issue 30/05/2020.**

6.2 **M/s. HINDALCO INDUSTRIES LTD.** is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT No.2,10,11,43,** AT &PO DAHEJ, LAKHIGAM, TAL.VAGRA, **GIDC ESTATE DAHEJ, DIST: BHARUCH.**

Sr. No.	Name of Haz. Waste	Category Number	Quantity	Facility
1	ETP waste sludge & Scrubber waste	8.2/I	175095 TPA	Collection ,Storage, transportation and

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	(Sludge & Filter cakes)			disposal at own SLF site/ common TSDF of BEIL.
2	Arsenic bearing sludge, As-Cu precipitate	7.3/I	270.80 TPA	Collection in closed stainless steel vessel, recycle & treatment /encapsulation & disposed at own SLF site/ common TSDF of BEIL.
3	Used oil	5.1/I	50 KL/Yr	Collection, storage, transportation and disposal by sale to registered re -refiners
4	Spent Electrolyte solution	8.1/I	52560 KL/Yr	Collection, Storage, treatment in in-house ETP.
5	Residue dust from SAP	17.1/I	12 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF
6	Spent catalyst	17.2/I	160 KL/Yr	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL
7	Used Empty Drums (Empty barrels/ Containers/ liners contaminated with hazardous chemicals /wastes)	33.1/I	200 TPA	Collection, Storage, Decontamination, Transportation and Disposal by reuse after in-house decontamination or send it to authorized decontamination facility / recycler or send back to supplier.
8	Flue gas cleaning residue (Exhaust air /gas cleaning residue)	35.1/I	864 TPA	Collection, Storage, Transportation and Recycle into process.
9	Spent resin from DM plant (Spent ion exchange resin containing toxic metals)	35.2/I	7.5 KL/Yr	Collection ,Storage, transportation and disposal at own SLF site / common TSDF of BEIL.
10	Selenium & selenium compounds.	A-8/II	6 TPA	Collection, storage, transportation and disposal by sell out to

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				authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
11	Silver compounds.	A9/III	6 TPA	Collection, storage, transportation and disposal by sell out to authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
12	Inorganic Acid (Spent Acids)	B15/II	66960 TPA	Collection, storage, transportation and reuse to Mfg of ALF3 /disposal by sell out to authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste after making MoU.
13	Dust & Lumpy	4/IV	35000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
14	Copper Converting or C-Slag	6/IV	6000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
15	Liberator cake	4/IV	3000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
16	Copper Revert	4/IV	72000 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
17	Dore Slag (Slags from copper processing for further processing or refining)	6/IV	2500 TPA	Collection, Storage, Transportation and recycle in smelter or sell to recyclers
18	Lead Anode/ Cathode	7./I	80 TPA	Collection, Storage, Transportation and

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				recycle in smelter or sell to recyclers.
19	Cotton waste used (Contaminated cotton rags or other cleaning materials)	33.2/I	15 TPA	Collection, Storage, Transportation and Disposal to CHWIF.
20	Used Insulation	X-X02	100 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.
21	Discarded PPE (Rubber)	X-X08	5 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.
22	Used membrane/ Filter cloth and bags	Z-Z37	20 TPA	Collection, Storage, Transportation and Disposal in furnace or into own SLF site / common TSDF of BEIL.

6.3 The authorization is granted to operate a facility as above.

6.4 The authorization shall be in force for a period **up to 02/03/2026**.

6.5 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

7. <u>TERMS AND CONDITIONS OF AUTHORISATION:</u>

7.1 The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.

7.2 The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the Gujarat Pollution Control Board.

7.3 The person authorised shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorisation.

7.4 Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.

7.5 The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;

7.6 The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty"

7.7 It is the duty of the authorised person to take prior permission of the Gujarat Pollution Control Board to close down the facility.

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7.8 The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.

7.9 The record of consumption and fate of the imported hazardous and other wastes shall be maintained.

7.10 The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.

7.11 The importer or exporter shall bear the cost of import or export and mitigation of damages if, any.

7.12 An application for the renewal of an authorization shall be made as laid down under Hazardous & Other Wastes (Management and Transboundary Movement) Rules-2016.

7.13 Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.

7.14 Annual return shall be filed by June 30th for the period ensuring 31st March of the year.

7.15 Unit shall have to display the relevant information with regard to hazardous waste as indicated in the Court's order in W.P. No. 657 of 1995 dated 14th October 2003.

7.16 Unit shallhave to display on-line data outside the main factory gate with regard to and nature ofhazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises.

7.17 Unit shall have to manage used or spent oil; empty or discarded barrels / containers / liners contaminated with hazardous chemicals / wastes, process waste as per Hazardous & Other Wastes (Management and Transboundary Movement) Rules-2016, framed under the E(P)Act-1986 and shall apply Authorization for all applicable waste.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(P.B Patel)
Dy. ENVIRONMENT ENGINEER

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