BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

Principal Bench, New Delhi

Original Application No. 226/2020

(Earlier O.A. 68/2020(CZ))

Om Puri — Applicant

Vs.

Hindustan Zinc Ltd. & Ors. — Respondent(s)

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(Nazimuddin)
Scientist-E
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar,
Delhi- 110032.

Date: 07.09.2021
Place: Delhi

Joint Committee Report

Hon'ble National Green Tribunal, Principal Bench vide its order dated 5th February 2021 in Original Application No. 226 of 2020 in the matter of Om Puri Vs Hindustan Zinc Ltd & Ors stated under Para 7 as:

"A factual report in the matter about compliance of norms by respondent No.1 be furnished as earlier directed vide order dated 18.08.2020 with the modification that the joint Committee will comprise of seven members i.e. the Collector Bhilwada, Rajasthan State PCB, nominee of Indian Institute of Technology (Indian School of Mines), Dhanbad, CPCB, CSIR-CIMFR, Chhattisgarh, Bilaspur, CSIR-CBRI Roorkee and IIT Roorkee. The nodal agency for compliance and coordination will be the CPCB. The State PCB may provide logistics for functioning of the Committee. The Committee may undertake visit to the affected area atleast once and except for such visit, it will be free to conduct other proceedings as per its convenience, by video conferencing or otherwise. The Committee may also conduct public hearing in the area, if necessary. This direction is being issued so that this Tribunal may simultaneously adjudicate upon all connected matters and for this purpose O.A. Nos. 49 to 53 of 2020 (CZ), 54 to 62 of 2020 (CZ) and 69 of 2020 (CZ) and any other connected matter raising the same issue in respect of the same mining lease will stand transferred to the Principal Bench for being considered alongwith the present matter. The Committee may also assess the monetary value of damage to the environment caused, if any, in the last three years. The Committee will be at liberty to co-opt any other expert or institution. It is made clear that the Tribunal may consider the quantum of compensation in the light of report of the Committee and response of the Company thereto, depending on the actual damage caused to the individual victims and to the environment, irrespective of the claim of the applicants. Based on the observations of the independent Committee, it will be open to the statutory authorities to take remedial action, following due process of law. The Committee may give its report within three months. A copy thereof may also be furnished to the respondent No. 1 Company for its response alongwith further action taken, if any, within three weeks from the receipt of the report, with advance copy to the CPCB, which may file supplementary report, if necessary, after cross checking the stand of the Company, within two weeks thereafter. The report or response thereto be filed 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."

In compliance of the Hon'ble NGT order, CPCB, the nodal agency constituted the 07 member committee. The committee constituted is as below:

1. Sh Vikas Mohan Bhati, SDM, Gulabpura, Bhilwara
2. Prof Biswajit Paul, Professor, IIT(ISM), Dhanbad
3. Dr Shantanu Sarkar, Chief Scientist, CSIR-CBRI, Roorkee
4. Prof Brijesh K Yadav, Dept of Hydrology, IIT, Roorkee
5. Dr Harsh Kumar Verma, Sr. Principal Scientist, CSIR-CIMFR, Bilaspur
6. Sh Sunil Kumar Meena, Sc-D, CPCB, Regional Directorate, Bhopal
7. Sh Mahaveer Mehta, Regional Officer, RSPCB, Bhilwara

The committee met two times online on 9th April 2021 and 29th June 2021 respectively. The committee discussed over the past compliance status of M/s Hindustan Zinc Ltd, ambient air quality, source emission and water monitoring data along with the records available with district administration & other concern departments about the livestock, crop & health data. Based on the discussion; relevant information were asked from the concern departments viz. District administration, RSPCB. Thereafter, the committee made its field visit during 12th & 13th July 2021 of the unit i.e. M/s Hindustan Zinc Ltd, and nearby villages specifically Khotiya, Araniya Chauhan and Agucha. One of the committee member i.e. Prof Biswajit Paul, Professor, IIT(ISM), Dhanbad was unable to join the committee in field visit due to prevailing COVID restrictions in his institute. The attendance of the meeting held on 12th & 13th July 2021 respectively is enclosed as an Annexure-I**.**

The committee hold meeting with officials of the unit on 12th July 2021 and visited the mine lease area to investigate the matter in light of the overburden dumping, plantation, tailing dam and its water re-circulation in the beneficiation plant and other issues. Followed, by the meeting and the field visit; committee visited the Araniya Chauhan village of the applicant Sh Om Puri and hold discussion on loss to agriculture produce, domestic animals, livestock's & human health, cracks in property and contamination of the groundwater with him and other residents of the nearby villages. The committee visited the agricultural fields where applicant showed the

damaged wells. To check the quality of the well water; 04 water samples were collected and analyzed at Rajasthan State PCB laboratory. On 13th July 2021 committee hold a meeting with the departments viz. Livestock, Agriculture, Medical, Water Supply and Ground Water. During meeting, discussion took place on any reported damage/loss in last 03 years i.e. 2018 to 2020 of livestock, agriculture. Similarly, PHED department was asked to furnish the report on the groundwater/surface water quality of the nearby area of the M/s Hindustan Zinc Ltd. The mining department was asked to survey the lease area of the unit and report on any illegal dumping outside the lease area. The Rajasthan PCB was asked to provide the air and water monitoring reports from year 2017 of the unit and nearby area.

Based on the field observations, discussion with villagers and available information provided by the departments, this joint report is prepared on the compliance status of norms and monetary value of the damage caused in last three years i.e. from calendar year 2018 to 2020.

1. Background of M/s Hindustan Zinc Ltd, Rampura Agucha mine

The mine lease no. 8/99 has area of 1200Ha; out of which 1048Ha land is acquired by the unit. The GPS co-ordinates of mine lease pillars are (Pillar – A (25.819494, 74.737589); Pillar – B (25.838942, 74.71675); Pillar-C (25.864086, 74.745408) & Pillar-D (25.844633, 74.766247)). The mine lease is for 50years that expires on 12th March 2030. The first Environmental Clearance of 0.9MTPA for Pb & Zn mining was obtained on 19.4.1983. The development of the Rampura Agucha (RA) mine was started in 1989 and commissioned its operation in 1991 as an open pit mine. The Mine excavates and produces Lead and Zinc ores by mining and Lead and Zinc concentrate by mineral processing operations. The mining and mineral processing operations include blasting, transportation, crushing, grinding, screening and ore beneficiation (flotation, thickening, and pressure filtration). The present capacity as per the Environmental Clearance (EC) dated 11th December 2009 is 6.15 million metric tons per annum (MMTPA) of ore production and 6.5 MMTPA of ore beneficiation plant (Four streams; each of 2.3MTPA, 1.5MTPA, 1.2MTPA & 1.5MTPA capacity) to produce zinc and lead concentrates. Further the EC was amended on 5.3.2012, 22.08.2014, 12.12.2014, 28.12.2015 & 28.02.2020.

The open pit mine progressively ramped up to its capacity, before it ceased operation in March, 2018 after attaining its economic and safe ultimate pit depth of 400m below surface. Beyond

400m depth, underground mining was considered as the best suitable option in sustaining production from this mine.

The Rampura Agucha (RA) Mine underground development activities commenced in year 2010 and production started from Oct-2012 onwards. RA underground mine operated concurrently with the open pit mine between year 2012 and 2018, till the completion of open pit mine life. Thereafter, RA mine completely transitioned into underground operation and presently continued.

During mining and beneficiation of ores, large quantity of overburden (OB) and tailings are generated. The present quantity of OB generated is about 2.0 million metric tonnes per annum (MMTPA) which is presently stacked within the mine lease boundary. The height of OB dump varies from 20 m to 140 m at present. The quantity of Tailing generated is about 5 million metric tonnes per annum (MMTPA). Part of tailing quantity approx. 40-50% from processing plant are converted to paste form along with suitable binder to back fill underground voids generated from production. Remaining part of tailing quantity are transported from beneficiation plants through closed pipelines to a confined area known as "Tailing Dam" which is located near to the ore beneficiation plant. The tailing dam is constructed with the mine over-burden and soil. The tailings in the slurry form are discharged to the tailing dam wherein the solids settled at the bottom of the tailing dam and the supernatant (water) is pumped back to the beneficiation plant for reuse.

2. Factual status of the compliance norms

Based on the discussion hold on 12th July 2021 with M/s Hindustan Zinc Ltd Rampura-Agucha mine officials on compliance status followed by field visit; the factual status of the specific conditions is as below:

2.1 Statutory permissions

i. The unit has valid Consent to Operate under Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 for Beneficiation for Lead Zinc Ore (6.5MMTPA) upto 28.02.2023. Copy enclosed as an Annexure-II.

ii. The unit has valid Consent to Operate under Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 for Lead & Zinc ore mining (6.15MMTPA) upto 28.02.2023. Copy enclosed as an Annexure-III.

iii. The unit has valid authorization under Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 for upto 30.11.2024. Copy enclosed as an Annexure-III.

iv. The unit has obtained No Objection Certificate (NOC) for ground water extraction from radial well in Banas river from Central Ground Water Board vide letter dated 8.7.2013. Unit has applied for renewal vide letter dated 04.04.2018. Copy enclosed as an Annexure-IV.

It is pertinent to mention that, as per the condition no. 11 (vi) of the notification no. S.O. 3289 (E) dated 24.9.2020 of Ministry of Jal Shakti (Central Ground Water Authority), the NOC shall be deemed to be extended till the date of renewal of NOC. The condition no. 11 (vi) states as :

11.0 Renewal of No Objection Certificate

vi. If the application for renewal is submitted in time and the CGWA/ the respective State/ Ut Authority is unable to process the application in time, No Objection Certificate shall be deemed to be extended till the date of renewal of No Objection Certificate.

Copy of the notification is enclosed as an Annexure-V**.**

2.2 Blasting operation

Due to depletion of zinc ore reserves in 2018, which was approachable from the surface, the company has shifted its mining operation from surface mining to underground mining to extract further the deep seated ores. The underground blasting is done in a very controlled manner as it is a matter of safety of underground personnel and mine workings. The blast designs, drilling patterns and the quantities of the explosive used are approved by Directorate General of Mines Safety (DGMS) and optimized by CSIR-CIMFR, Dhanbad. Extreme care is to be taken so that its own mining tunnels (i.e., mine workings) do not get damaged due to blast vibrations (i.e., prevention of over-breaking) otherwise it may create unsafe conditions in underground. The blasting operation is carried out under supervision of expert agency. The company uses water resistant 'permitted' explosives like Powergel cartridges for blasting. Electronic micro-second delay detonators are used to further control the blast vibrations and maximizing ore outputs. Large diameter 'relief holes' (102mm ϕ) and 'uncharged holes' (45mm ϕ) are kept to reduce

further vibrations, during blasting in the mine. This technique minimizes the usage of explosives and increases output of ore per blast.

As per the present Indian standards, as mentioned in DGMS (Tech) (S&T) Circular No. 7 dated 29th August of 1997 (Copy of the circular is enclosed as an Annexure-VI), depending on the type of structures and dominant excitation, the peak particle velocity (PPV) on the ground adjacent to the structure shall not exceed the values is as tabulated below:

Table no. 1 Permissible Peak Particle Velocity (PPV) at the foundation level of structures in Mining Areas in mm/s

Type of Structures	Dominant Excitation Frequency, Hz		
	< 8 Hz	8 - 25 Hz	> 25 Hz
(A) Buildings/structures not belong to the owner			
Domestic houses /structures (Kuchha brick and cement)	5	10	15
Industrial buildings (RCC and framed structures)	10	20	25
Objects of historical importance and sensitive Structures	2	5	10
(B) Building belonging to owner with limited span of life			
Domestic houses /structures (Kuchha brick and cement)	10	15	25
Industrial buildings (RCC and framed structures)	15	25	50

The present Indian standard is a frequency based criterion. As the frequency of vibration increases the threshold value of damage also increases. Indian Standard also recommends minimum PPV value of 5.0 mm/s for domestic houses which correspond to less than 8 Hz frequency. As the frequency increase above 8 Hz, the limiting PPV value enhances to 10 mm/s and 15 mm/s for frequency range 8- 25 Hz and greater than 25 Hz respectively.

In present case, the safe permissible limit of peak particle velocity (PPV) for domestic houses and industrial building not belonging to mine management is 15 mm/s and 25 mm/s respectively, corresponding to > 25 Hz frequency range as per the present DGMS criterion.

The blast vibration data of underground mine provided for 23.10.2020 to 2.3.2021 is enclosed **as** an Annexure- VII**.** The 36 data set of vibration and associated explosive charge analysed and

found that dominant frequency of the vibration induced is greater than 50 Hz. The PPV values provided by HZL unit shows that the majority of the PPV value is less than 5.0 mm/s. Therefore, blast induced ground vibration is found to be well within the safe limit for domestics houses as well as industrial building. Following are the other observations on blasting practices

i. The unit has conducted subsidence study for increasing the depth of underground mine working from 1000mbgl to 1500mbgl in 2020 from Central Institute of Mining & Fuel Research (CIMFR). Subsidence due to blasting operations was not observed.
ii. Blasting operation is carried out with various control measures as per DGMS guidelines to ensure safety.
iii. Explosive charge weight per delay and total explosive charge in a blasting round is followed considering the minimization of blast vibration within stipulated standards for safety of nearby underground structures as well as surface residential/industrial structures.
iv. The vibrations monitored are well within the prescribed limits by DGMS by use of permitted explosives, electronic detonators, relief holes, etc.
v. Peak Particle velocity of blast vibration is being monitored for every blast & records are maintained, within DGMS limits.
vi. Wet drilling system is adopted to reduce air borne dust particles.

2.3 Fugitive emission management

There are 03 crushers viz. Primary crusher-New (700TPH), Primary crusher-Old (700TPH) & secondary crusher (700TPH). To curtail the fugitive emission at various points following is provided:

i. Adopted wet drilling operations.
ii. Conditioning of ore is carried out during crushing. Mist water spraying system at ore crushing area followed by bag filter & adequate stack height.
iii. The conveyor belt of ore mill plant & beneficiation ore plant are covered. Dust extraction system & water sprinkling nozzles are installed on conveyor belts, transfer points & stockpiles.
iv. Installed Semi-Autonomous-Grinding mills to eliminate dry secondary and tertiary Crushing

v. Water sprinkling is carried out by 04 nos. of 40KL water sprinkler on Haul roads of mine area.

vi. The use of chemical wetting agents for dust suppression on haul roads.

vii. Cleaning of industrial roads by truck mounted mechanical road sweepers

Ambient air quality manual monitoring is carried out at 3 locations inside mine i.e. Mine Site, Mine Gate & Mine tower and 3 locations outside the mine area i.e. Agucha Village, Khotiya village and Bherukhera village twice monthly for SPM, PM10, PM2.5, SOx, NOx & CO. All the monitoring locations are meeting 24 hourly National Ambient Air Quality Standards, 2009. Monitoring reports since 2017 to 2020 is as tabulated below:

	PM10 @ Mine Site				Agucha Village				Kothiya Village				Bherukhera Village			
Month	2017	2018	2019	2020	2017	2018	2019	2020	2017	2018	2019	2020	2017	2018	2019	2020
Jan	78.64	76.32	76.39	71.25	61.47	62.09	66.34	63.44	57.8	56.24	68.22	56.29	56.57	61.49	62.37	62.84
	81.52	84.61	92.03	79.82	60.61	68.61	70.14	62.5	57.19	59.7	57.59	60.78	51.13	58.26	59.7	55.96
Feb	77.67	88.13	84	69.04	68.14	61.92	63.47	61.63	57.24	52.73	67.2	56.29	56.85	64.8	66.47	55.75
	78.01	76.19	85.33	87.16	71.39	57.02	67.67	63.67	62.98	55.42	67.51	52.32	47.15	59.6	66.88	77.67
Mar	74.14	79.99	83.67	68.84	68.23	63.65	67.11	59.7	56.16	59.94	67.08	54.89	59.59	63.73	59.6	55.15
	82.03	82.73	77.64	73.12	73.82	61.83	67.2	60.95	62.17	68.8	64.58	53.29	53.21	62.3	61.4	53.13
Apr	82.87	86.22	79.99	63.71	69.78	76.52	76.19	49.97	61.11	71.78	67.08	54.89	64.37	72.75	59.6	55.15
	85.52	87.19	78.37	69.71	71.22	73.53	69.67	60.95	60.03	64.4	64.58	53.29	56.09	66.82	61.4	53.13
May	87.28	85.92	86.94	68.76	73.58	62.16	76.59	62.97	60.7	67.57	66.24	62.3	61.42	62.3	62.43	57.39
	81.67	91.53	82.58	73.25	65.67	68.23	67.97	62.3	60.73	69.88	64.96	53.35	53.6	66.41	73.77	50.37
Jun	77.68	79.63	88.41	74.74	68.43	63.17	66.64	62.1	60.7	60.38	67.59	59.09	63.1	59.5	66.24	58.96
	47.51	80.31	81.2	68.43	49.1	65.42	71.93	60.21	63.32	61.25	67.66	57.76	66.36	63.95	66.5	56.03
Jul	69.78	75.51	68.98	71.92	62.9	57.82	57.08	62.36	60.7	79.44	60.23	65.87	62.5	64.15	60.14	52.49
	54.07	57.91	70.67	72.65	53.59	50.2	44.18	48.94	51.32	54.51	57.67	49.42	47.8	49.69	64.92	56.09
Aug	72.12	84.54	64.38	74.03	48.27	57.33	56.32	71.87	59.84	73.68	43.74	57.76	56.85	67.02	45.1	56.03
	74.4	74.64	68.18	66.52	53.81	53.71	60.23	39.8	50.32	61.21	57.76	38.93	51.05	65.23	53.49	46.43
Sep	75.59	74.91	67.06	59.6	66.48	64.7	56.16	78.93	59.5	63.06	49.34	68.91	56.57	63.03	52.88	75.58
	78.57	61.7	58.82	83.94	58.63	69.99	43.72	55.06	63.13	72.17	41.21	48.45	52.21	63.89	42.15	52.55
Oct	88.4	65.97	67.06	88.74	59.59	66.79	60.74	79.8	54.55	65.64	52.35	52.98	67.95	67.74	55.34	51.61
	85.33	79.15	86.79	75.43	52.78	56.82	66.28	72.9	55.02	54	52.76	53.16	55.15	49.54	51.87	58.83
Nov	74.5	74.83	68.31	71.48	59.16	66.07	60.75	74	62.02	65.64	52.35	63.63	61	65.67	55.35	58.17
	79.24	83.36	85.83	82.45	72.76	60.23	69.07	73.68	74.79	71.99	57.32	67.74	74.81	68.9	63.2	59.16
Dec	75.12	73.78	71.11	76.46	59.56	65.77	63.1	56.36	59.87	61.42	59.03	55.62	56.24	65.04	55.03	56.51
	83.05	73.07	78.38	72.82	66.45	51.89	66.07	61.49	50.4	55.24	60.09	60.08	63.29	56.24	65.33	64.04

The available limited ambient air quality data for PM_{10} of last 03 years i.e. 2018 to 2020 compared with air quality data of year 2017 revealed that the Air Quality was stable with no incremental value in last 03 years in and around the surrounding villages i.e. Agucha, Kothiya & Bherukhera. Monitoring reports since 2017 to 2020 are enclosed as an Annexure-VIII**.**

The monitoring reports of AAQM carried out by Rajasthan State Pollution Control Board during 2018 to 2020 also shows that all the location were meeting the 24 hourly NAAQS, 2009. Reports are enclosed as an Annexure-IX**.** The results are briefed as below.

S.No.	Sampling Location	Date of monitoring	PM10 (µg/m3)
1.	Main Gate of the Unit	06.08.2018	83
		25.11.2019	75
		28.12.2020	90
2.	Mine Pit of the Unit	06.08.2018	75
		28.12.2020	72
3.	Mine Tower of the Unit	06.08.2018	67
		25.11.2019	93
		28.12.2020	92
4.	Agucha Village	25.11.2019	79
5.	Bherukhera Village	25.11.2019	91
6.	Kothiya Village	25.11.2019	84

Unit has installed 03 Continuous Ambient Air Quality Monitoring System (CAAQMS) of AEROQUAL AQM 65 Make; installed one in upwind and 02 in downwind direction. The Ambient Air Quality Monitoring is carried out for CO, NOx, SO2, $PM_{2.5}$, PM_{10} & TSP. The location is as tabulated below:

S.No.	Location of CAAQMS	GPS coordinates
1.	Orica site	25.830029, 74.731033
2.	Main Gate	25.839174, 74.727852
3.	Near Waste dump (100mtrs from dump)	25.840778, 74.755961

2.4 Water management

i. M/s HZL Rampura-Agucha mine has daily water requirement of 16198KLD. Out of which 8450KLD as fresh water is received from the radial well in Banas River. Central Ground Water Board has issued NOC for 11700KLD ground water extraction from existing Radial Well/Tubewell vide letter dated 8.7.2013. Unit has applied for renewal vide letter dated 4.4.2018.

The water sources against the daily requirement are as below:

S. NO.	Source of water	Quantity in KLD	Water Quality	Major usage	Water Use (%)
1.	River Water	8450	Fresh water	Drinking Plant domestic consumption Reagent preparation Colony Process make up	55.2%
2.	Tailing dam	7192	Recycled	Milling and Mining process water sprinkling on road vehicle washing, cooling towers paste filling	44.4%
3.	Mine dewatering	189	Fresh water	Milling and Mining process water sprinkling on road vehicle washing cooling towers paste filling	1.2%
4.	STP treated water	367	Treated water	Horticulture	2%

ii. To improve the water recovery from beneficiation plant; all the conventional thickeners retrofitted to High Rate Deep Cone Thickeners.

iii. Sewage treatment plant of 425 KLD capacity in colony and 300 KLD in mine area was found operational. The treated effluent is used in horticulture & dust suppression. Oil and grease trap installed for workshop effluent.

iv. There are 02 water bodies near mine lease. River Khari in North and River Mansi in South; which are 4 kms and 1.2 kms far from the buffer zone respectively. The water course was not found obstructed due to the mining operations as there is no mine activity of M/s HZL outside the mine lease area.

v. The ground water monitoring in and around the mine lease area is being carried out through 08 piezometer well & 11 wells; four times in a year. The Six-monthly compliance reports of last 03 years (2018-2020) have shown no significant change in the ground water quality. Copy of the Groundwater report is enclosed as an Annexure-X**.**

vi. The piezometer named as ADM, P, K & A are in upstream of tailing dam whereas piezometers viz. E,G, H & I are in downstream of the tailing dam. The piezometers water sampling carried out by Rajasthan State PCB during 2014 to 2020 revealed no significant increment trend for any parameter in consecutive years. The increased values of Hardness,

Chloride, Sulphate in one year followed by reduced concentration in next year may be due to the varying sampling schedule. The reports are enclosed as an Annexure- XI**.** The results are as tabulated below:

		pH	Total Hardness	SO_4^{-2}	Cl^-	F^-	Fe	Pb	Cd	Zn
IS 10500:2012		**6.5-8.5**	**600**	**400**	**1000**	**1.5**	**0.3**	**0.01**	**0.003**	**15**
Piezometer A near Material Gate (near Bherukhera village opening)	31.10.2014	8.31	650	162.5	880	0.96	ND	ND	ND	ND
	15.2.2017	8.21	ND	779	292	ND	0.168	0.04	NT	0.193
	28.12.2020	7.81	1392	359	260	0.545	0.147	NT	NT	NT
Piezometer ADM near Admin Block.	31.10.2014	7.87	540	475	568	0.56	ND	ND	ND	ND
	15.2.2017	8.01	ND	1302	408	ND	0.275	0.065	NT	0.141
	28.12.2020	7.97	260	376	164	0.62	0.404	NT	NT	0.253
Piezometer E- 1 behind new pump house	15.2.2017	8.10	ND	1656	536	ND	4.73	0.072	NT	1.04
	28.12.2020	8.2	916	230	232	0.524	0.210	NT	NT	0.025
Piezometer G-1 near Papri Kheda Village downstream of Tailing Dam)	28.12.2020	7.97	500	290	248	0.481	0.213	NT	NT	0.049
Piezometer H near Tailing Dam.(before IBP)	31.10.2014	7.6	528	255	968	0.8	ND	ND	ND	ND
	15.2.2017	7.97	ND	198	160	ND	0.862	0.047	NT	0.275
	28.12.2020	8.0	744	314	288	0.549	0.412	NT	NT	0.056
Piezometer I-1 near reclaim water pump house	31.10.2014	8.48	320	305	944	076	ND	ND	ND	ND
	28.12.2020	8.0	656	338	272	0.478	0.393	NT	NT	0.136
Piezometer K CISF Colony (near mine pit boundary)	31.10.2014	8.34	290	105	468	1.42	ND	ND	ND	ND
	15.2.2017	8.24	ND	178	136	ND	0.476	0.046	NT	1.19
	28.12.2020	7.9	464	251	184	0.547	2.36	NT	NT	0.24
Piezometer P near Central Workshop	31.10.2014	8.1	560	52	664	1.16	ND	ND	ND	ND
	15.2.2017	8.02	ND	1269	480	ND	0.630	0.075	NT	0.183
	28.12.2020	7.8	572	534	284	0.449	0.44	NT	NT	0.089
Tailing Dam Water	28.12.2020	7.2	2024	1400	1480	0.578	0.297	NT	NT	2.94

A study conducted by National Environmental Engineering Research Institute (NEERI) Nagpur in year 2016 as “Assessment of aquifer vulnerability at Rampura-Agucha Mine of Hindustan Zinc Limited” concluded as:

"Comparison of characteristics of tailing dam water/seepage water with that of groundwater quality around the tailing dam of RA mine revealed that there is no co-relation between the characteristics of tailing dam water/seepage water and the groundwater quality around the tailing dam especially in the downstream direction (North, North-East, East). It is therefore concluded that construction and operation of tailing dam at RA mine has not posed any threat to groundwater resources in the area. The high values of TDS, Chlorides, Sulphate and Sodium in groundwater, which was observed both in upstream as well as downstream of tailing dam be attributed to the local geological and hydrogeological setup of the study area.

Although there is seepage of water from the tailing dam for last few years, the contamination of groundwater has not occurred, possibly due to existence of clayed soil and hard, compact and massive rocks beneath the tailing dam area as established through reported geophysical investigations."

The copy of the **NEERI, 2016 report** is enclosed as an Annexure-XII

2.5 Overburden management

i. The annual Overburden (OB) generation is to the tune of 2.0 million metric tonnes per annum (MMTPA) which is presently stacked within the mine lease boundary. The height of OB dump varies from 20 m to 140 m at present. Vide amended Environmental Clearance letter no. J-11015/267/2008-I-A-II (M) dated 22.08.2014 the maximum height of dump allowed from 100m to 140m (in two lifts of 20m each). Copy of the EC dated 22.08.2014 is enclosed as an Annexure-XIII**.**

ii. Waste is dumped in earmarked location with 7 lift of 20 m each to maximum height of 140 mtrs. The overall slope is maintained in tune of 27^0. The waste dump design and slope stability is reviewed by Central Institute of Mining & Fuel Research, Dhanbad (CIMFR).

iii. The stabilization of the OB dump through vegetation is carried out in phase manner. The dumps are covered by geo-textiles sheet. As informed, total Geo-textiles 1,45,000 M^2 (14.50 Ha.) laid at waste dump

iv. Garland drain is constructed along the waste dump toe and mining pit, along with siltation pond. This provides retention for silt settlement. Rainwater collection sumps of about 8.5 Lakhs M^3 capacity are constructed. The collected water is utilized for watering in mine area, roads, green belt development. Retaining wall at the toe of the OB dump is constructed along the garland drain. However, de-siltation of the drain needs to be regularly carried out to avoid any discharge outside the lease boundary.

2.6 Tailing management

The tailing dam is in 4.5kms perimeter. The sides of the tailing dam are lined with HDPE. The present height of tailing dam is 54 meter. Height rising by 6m was ongoing. Garland drains are constructed around the tailing pond with pumping arrangement to collect any seepage and rainwater runoff back to tailing pond. The tailings of the beneficiation plant are being disposed through closed pipeline to the earmarked tailing dam after lime treatment. The tailing dam water is reused in the process plant.

2.7 Green belt development

i. Safed babool is the most abundant tree species planted in the project area; along with other species viz. Shisham, Pongamia, Bombax Ceiba, Tamarind, Arjun, Amla etc. The green cover was observed less dense (<1500tree/hectare). As per the Env Clearance dated 11.12.2009 condition XVI "The density of the trees should be around 1500 plants per hectare."

ii. As per the study carried out by Terracon Ecotech Pvt Ltd (Sept 2015) there were 91 various tree species recorded.

iii. The details of the plantation in the lease area is as tabulated below:

RAMPURA AGUCHA MINE (With in lease)			
S. No.	**Session of Plantation**	**Plantation Status**	**Plantation Area (Ha.)**
1	Till- 2014-15	283,550	243.30
2	2015-16	7,100	4.70
3	2016-17	4,000	4.20
4	2017-18	17,000	17.00
5	2018-19	20,000	20.00
6	2019-20	20,000	20.00
7	2020-2021	20,000	20.00

Plantation total		371,650	329.20
S.NO.	**Geo-textile with seed spreading and plantation**	**Area Sqm**	**Area Ha.**
1	Till -2016-2017	72000	7.2
2	2017-2018	8000	0.8
3	2018-2019	15000	1.5
4	2019-2020	25000	2.5
5	2012-2021	25000	2.5
	Geo-textile Total	145000	14.5
Total Green belt (Plantation + Geo-textiles)			**343.7**
Plantation Out site lease			
S. No.	**Area/Location**		**Plantation Area (Ha.)**
1	COLONY SITE		37.76
2	ROAD SIDE (FROM COLONY TO MINE)		7.15
3	OTHERS (In Govt Land near Parasrampura)		8.00
	Total Area		**52.91**

2.8 Committee observations

The M/s Hindustan Zinc Ltd Rampura-Agucha (RA) mine is majorly complying the stipulated norms under Environmental Clearance granted in year 2009 and EC amendment thereafter. However, committee observed following non-compliances after having field visit and document verifications:

1. The plantation cover reported was found less dense as per the EC, 2009 specific condition no. xvi.
2. De-siltation of the tailing dam garland drain needs to be regularly carried out to avoid any overflow towards North direction of the tailing dam.
3. The crusher area needs to have rubber/transparent curtains to curtail the fugitive emission during unloading of the ore in crusher area.
4. Water sprinklers needs to be established in more number to curtail the fugitive emission during truck movement on the haul road.

3.0 Visit of the affected area

The committee members visited village Araniya Chauhan; where along with applicant Sh Om Puri, villagers of Araniya Chauhan, Agucha, Kothiya and others were present. The issues related

to loss to agriculture produce, domestic animals, livestock's & human health, cracks in property and contamination of the groundwater were heard by the committee. The committee visited few fields where damaged wells, pits in land were shown. Water samples were collected by Rajasthan State PCB for analysis.

The issues raised by the villagers were discussed with the concern departments of the district on 13th July 2021. The summary of the details provided by the concern departments is as below:

3.1 Status of the water quality in Hurda block, Bhilwara

Public Health Engineering Department, Govt. of Rajasthan carry out periodic sampling from the shallow Tubewell & delivery point. The water analysis report since 2017 of Hurda block of Bhilwara district reflect that the Panchayat of Aguncha, Barantiya, Kotri, Bhojras, Barla & Hurda falls in the 10 kms of the periphery of the M/s HZL Rampura-Agucha mines are having high concentration of Chloride, Nitrate, Total Dissolved Solids, Fluoride, Hardness & Sulphate w.r.to the drinking water standards IS 10500:2012. The high values of these drinking water parameters in groundwater, which was observed in all around the mine villages, be attributed to the local geological and hydrogeological setup of the study area as earlier reported in the report of NEERI. The maximum values observed at Panchayats are as tabulated below:

Name of the Panchayat	**Geo-graphical location**		**Observed maximum concentration (in mg/l) since 2017**					
	Latitude	**Longitude**	**Cl^-**	**NO_3^{-2}**	**TDS**	**F-**	**Hardness**	**SO_4^{-2}**
Aguncha	25.824069	74.72732	2320	620	8760	5.6	3350	751
Barantiya	25.79141	74.76407	3000	238	7650	6.9	3700	1710
Kotri	25.88827	74.73792	3950	206	9180	3.5	2650	516
Bhojras	25.772225	74.66049	1490	338	4370	8.4	1250	400
Barla	25.833413	74.69219	3500	208	8270	8.7	2890	1510
Hurda	25.897337	74.68903	1330	378	4920	3.6	2026	614
Drinking water (IS 10500:2012) Permissible limit			**1000**	**45**	**2000**	**1.5**	**600**	**400**

The analysis report submitted by the PHED department is enclosed as an Annexure-XIV**.**

04 groundwater samples were collected from few locations using the available tube-well or open wells during the visit from Araniya Chauhan village to characterize the groundwater

quality. These samples were taken from random depths of confined / unconfined aquifers as monitoring network was not readily available around the plant site. The committee observed significant variation in groundwater table at visited places that shows, there is a strong heterogeneity of groundwater flow regime of the area. The NEERI report is related to groundwater pollution and its sources apportionment is quite old. Thus it is difficult to conclude that quantity and quality of groundwater resources of the area are not affected by the Industrial activities.

A further groundwater sampling during the pre and post monsoon seasons is needed to be conducted by the industry from appropriate depths and locations in and around the plant premise. It is also suggested to conduct hydrogeological survey of the plant site using a series of geophysical investigations and suitable pumping/recovery testes to map the groundwater flow regime and its seasonal dynamics. Isotopic analysis of surface and groundwater samples of the area is recommended strongly to establish the sound linkages between the possible subsurface pollutants and the Industrial activities of the area.

The water samples collected on 12.7.2021 from 04 locations shown the following water quality:

S.No.	**Location**	**pH**	**Cl^-**	**Hardness**	**F-**	**SO_4^{-2}**	**Zn**
1.	Open well in Agri field of Sh Bhawani Shankar Mali, Araniya Chauhan village	7.66	**1920**	**876**	1.31	**633**	0.768
2.	Open well in Agri field of Sh Ram Prasad Mali, Araniya Chauhan village	7.64	**2200**	**940**	1.35	**1087**	0.363
3.	Borewell in Agri field of Sh Bhawani Shankar Mali, Araniya Chauhan village	7.56	**2440**	**868**	**1.74**	**678**	0.137
4.	Open well in the land of Sh Ram Chandra Regar, Near highway	7.59	**3280**	**1036**	**2.14**	**629**	0.111
IS 10500:2012		**6.5-8.5**	**1000**	**600**	**1.5**	**400**	**15**

Note: All values are in mg/l except pH.

The analysis result reveals that the Chloride, Hardness & Sulphate is in higher concentration at all the 04 locations of the Araniya Chauhan village. The fluoride concentration was also observed higher at 02 locations w.r.to the prescribed IS 10500:2012 standards of 1.5mg/l.

The analysis report is enclosed as an **Annexure-XV.**

3.2 Status of agriculture production

The 04 years (Since 2017) agriculture production details of Gram Panchayat Agucha provided by the office of Assistant Agriculture Officer, Gulabpura-I is as tabulated below:

S.NO.	Crop	Year-wise production in Quintal/Ha				Remark
		2017-18	2018-19	2019-20	2020-21	
1.	Wheat	40.5	42.5	48.12	50.6	The production of Urad & Moong reduced in year 2019-20 & 2020-21 due to Yellow Mosaic disease and excess rain.
2.	Barley	28.5	30.3	31.0	31.5	
3.	Gram	9.5	10	15	10.62	
4.	Mustard	13.5	14.0	15.0	15.5	
5.	Maize	25.5	26.0	24.5	27.0	
6.	Cotton	23.0	24.0	26.5	25.8	
7.	Urad	7.125	7.625	9.5	1.8	
8.	Moong	6.0	6.7	5.7	5.0	

The Agriculture department's water test reports of year 2016 & 2019 of villages viz. Bherukhera, Agucha, Parasrampura, Kalyanpura, Kothiya, Balapura & others revealed that the pH ranges between 7 to 8.7, Sodium Adsorption Ratio ranges between 2.04 to 38.6 and the Electrical Conductivity ranges between 1.9 to 14.9mS/cm that makes the water alkaline & saline.

For such water quality, it is recommended to increase the number of the water irrigation and use of gypsum. The report is enclosed as an Annexure-XVI**.**

3.3 Status on the loss of livestock

A report submitted by Dr Satish Malvi, Veterinary Hospital, Hurda, Bhilwara dated 17.7.2021 state that a three member committee was constituted for surveying the records of the Veterinary hospitals established nearby the M/s HZL Rampura Agucha mine for any livestock death reported due to the pollution. The report concludes that there is no entry available in the outdoor records that show ill-effect of pollution on the livestock. The report is enclosed as an Annexure-XVII**.**

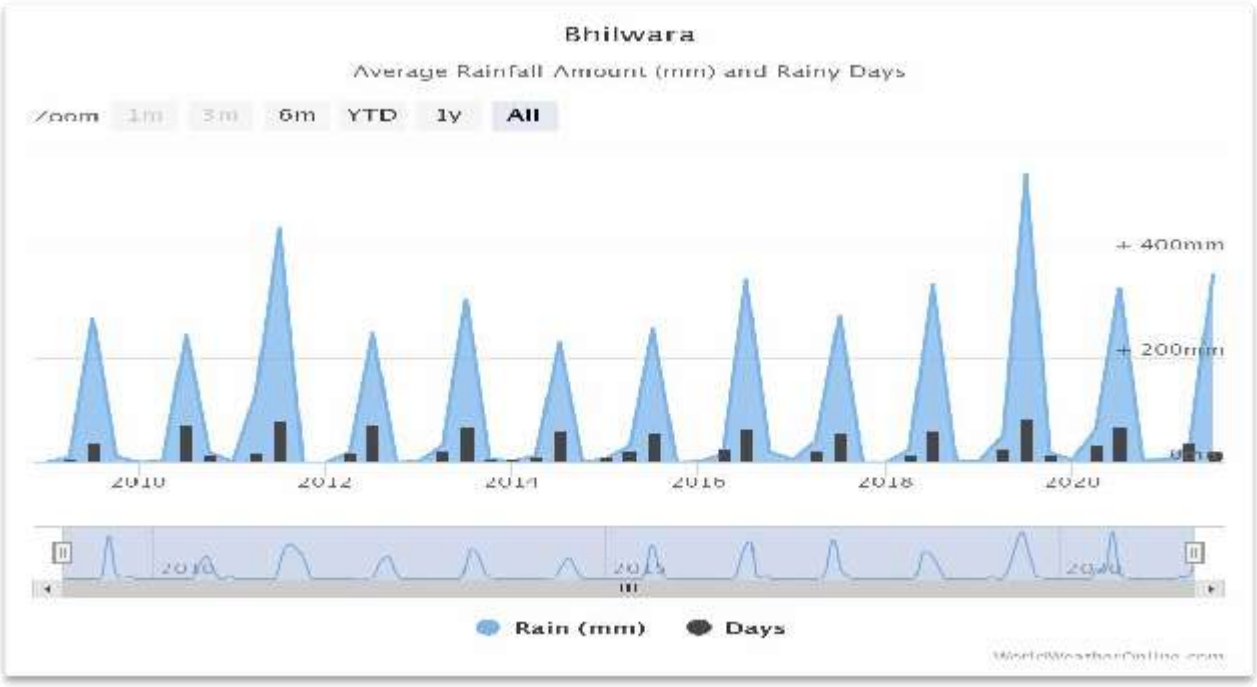
3.4 Status of ground water level around the mine lease area

The information provided by the Groundwater department, Bhilwara regarding the groundwater level trend around the periphery of Rampura Agucha mining area from year 2011 to 2020 is as tabulated below:

Year	Duration	Water level in meter around the peripheral villages of Rampura Agucha mine area				
		Agoocha (Dug well) GPS location (25.821942, 74.731394)	Agoocha (Piezo-well) GPS location (25.826836, 74.729236)	Bhairon Khera (Piezo-well) GPS location (25.816861, 74.764139)	Hurda Seja (Dug well) GPS location (25.902631, 74.68325)	Kothiya (Dug well) GPS location 25.8717, 74.767406)
2011	**Pre-Monsoon**	DRY	9.15	-	9.95	Covered
	Post-Monsoon	DRY	1.00	-	8.10	Covered
2012	**Pre-Monsoon**	DRY	3.95	-	10.85	12.25
	Post-Monsoon	DRY	1.10	-	8.30	4.35
2013	**Pre-Monsoon**	DRY	5.95	-	10.20	13.55
	Post-Monsoon	DRY	2.47	-	7.80	6.20
2014	**Pre-Monsoon**	11.8	5.90	-	15.60	15.15
	Post-Monsoon	11.7	1.45	-	7.60	5.35
2015	**Pre-Monsoon**	11.7	5.75	-	10.00	14.15
	Post-Monsoon	13.5	3.60	-	8.75	13.55
2016	**Pre-Monsoon**	14.6	14.35	-	10.40	DRY
	Post-Monsoon	9.00	2.15	-	7.60	3.15
2017	**Pre-Monsoon**	11	5.65	-	9.2	11.5
	Post-Monsoon	12.6	8.65	-	7.20	12.45
2018	**Pre-Monsoon**	15.00	13.65	-	8.90	12.25
	Post-Monsoon	13.00	4.35	2.30	4.20	10.80
2019	**Pre-Monsoon**	12.80	Filled	4.90	10.00	12.80
	Post-Monsoon	1.80	0.35	0.80	4.90	2.40
2020	**Pre-Monsoon**	9.60	2.85	1.30	6.50	3.05
	Post-Monsoon	6.30	2.95	3.20	6.70	1.85
Fluctuation from Pre_2011 to Pre_2020		**-**	**6.30**	**-**	**3.45**	**-**

The water level report reveals that the water level of village Agucha & Hurda Seja in year 2020 positively increased by 6.30 mbgl & 3.45 mbgl respectively since 2011 level. The water level information is enclosed as an Annexure- XVIII**.** On comparing the water level during last 3 years viz. 2018 to 2020; it is observed that water level positively increased in all the 05 locations round the mine area. This indicates towards the high recharge in the area either by more rainfall or by seepage from the large water pond existing in the industrial premise. As

per the last 10 years of average rainfall data, highest average rainfall of +550mm was observed only during the year 2019 since 2011. This shows possibility of groundwater flow from Industrial zone towards the surrounding regions. The average rainfall detail is as below:



The damage of the water well and formation of the large pits in land may be due to rising sub-surface water level. It is suggested having the hydro-geological survey of the affected area using geophysical investigations and suitable aquifer testes to map the groundwater flow regime of the area.

3.5 Status of the Health in villages around the mine lease area

As per the information furnished by Block Chief Health Officer, Gulabpura, Bhilwara vide letter dated 26.8.2021 of the last 05 years (2017-20) Out-Door Patients (OPDs) visits in Gulabpura blocks hospitals i.e. Hurda, Agucha, Ruphailekalan, Kanwliyas, Sareri & Gulabpura, it was observed that only 0.03% OPDs were w.r.t. Asthma. Also the OPD visits with Asthma from 2018-20, not showing any significant increasing trend w.r.to 2017 OPDs. The copy of the same is enclosed as an Annexure- XX.

The field photographs are enclosed as an Annexure-XXI**.**

4.0 Monetary value of damage to the environment in the last three years

To bring out the damage to the environment done by the Project Proponent (M/s Hindustan Zinc Ltd Rampura Agucha mine) in the last three years i.e. 2018, 2019 & 2020; the committee gone through the Six Monthly Environmental Clearance Compliance reports submitted by the (PP) since 2017 to the Statutory Authorities i.e. MoEF&CC, CPCB & RSPCB. Based on the available information and compliance observed during field visit on 12th July 2021, the committee brought out that less dense plantation may be considered as the major non-compliance during last 03 years w.r.to the Environmental Clearance condition.

4.1 Monetary value against the less dense plantation in last 03 years

The details of plantation carried out during last 03 years i.e. 2018-19 to 2020-21 are as tabulated below:

RAMPURA AGUCHA MINE (With in lease)			
S. No.	**Plantation in last 3 years**	**Plantation Status**	**Plantation Area (Ha.)**
1.	2018-19	20,000	20.00
2.	2019-20	20,000	20.00
3.	2020-21	20,000	20.00
Plantation total		**60,000**	**60**

The average per hectare plantation is = **1000 trees/Ha**

As per the Environmental Clearance dated 11.12.2009 specific condition no. xvi "The density of the trees should be **around 1500 plants** per hectare."

So the difference in plantation/hectare = **(1500 – 1000) = 500/ha**

Considering the cost of plantation & post-plantation care = Rs. 300/tree *(As per the EIA,* 2009 report Chapter 7 Environmental Monitoring Programme *of the Mine lease area)* Copy enclosed as Annexure-XXII.

Monetary value against the less dense plantation = Area under plantation **(2018-19 to 2020-21) x** (difference in plantation/Ha) **x** Cost of plantation

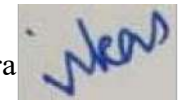
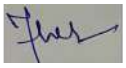
= 60 x 500 x 300

= Rs. 90,00,000/- (Ninety Lacs Rupees)

5.0 Recommendation:

As per the factual situation of the compliance status observed by the committee during field visit on 12th July 2021, following is recommended:

1. A monetary value of **Rs. 90,00,000/-** (Ninety Lacs Rupees) against violating the Environmental Clearance, 2009 specific condition no. xvi for plantation may be imposed on the unit.
2. To increase the plantation as per the EC condition stipulated under condition no. xvi of EC, 2009.
3. Unit need to carry out the hydrogeological survey of the surrounding area to map the current groundwater flow regime and its seasonal dynamics for identifying the cause of pit formation in the surrounding areas.
4. Unit need to carry out isotopic analysis of surface and groundwater samples of the area to establish the sound linkages between the possible sub-surface pollutants and the industrial activities of the area.
5. The unit ensure desiltation of the tailing dam garland drain regularly to avoid any overflow and seepages towards North direction of the tailing dam
6. To increase the number of water sprinklers to curtail the fugitive emission at crusher area, haul road & others.

1. Mr. Vikas Mohan Bhati, SDM, Gulabpura, Bhilwara 
2. Dr Shantanu Sarkar, Chief Scientist, CSIR-CBRI, Roorkee
3. Prof Biswajit Paul, Professor, IIT(ISM), Dhanbad
4. Prof Brijesh K Yadav, Dept of Hydrology, IIT, Roorkee Brijesh Kumar Yadav Digitally signed by Brijesh Kumar Yadav DN: cn=Brijesh Kumar Yadav, o=Indian Institute of Technology Roorkee, ou=Department of Hydrology, email=brijesh.yadav@hy.iitr.ac.in, c=IN Date: 2021.08.31 13:44:08 +05'30'
5. Dr Harsh Kumar Verma, Sr. Principal Scientist, CSIR-CIMFR, Bilaspur 31/8/2021.
6. Mr. Sunil Kumar Meena, Sc-D, CPCB, Regional Directorate, Bhopal 
7. Mr. Mahaveer Mehta, Regional Officer, RSPCB, Bhilwara 

Meeting OA -226/2020

Dated 12-07-2021

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9	Vinod Kumar	vinod.kumar@vedanta.co.in	9001294923	
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12	Dinesh Kumar Paliwal	dineshkumar.paliwal@vedanta.co.in	8003097088	
13.	Nirmalendu Kumar	nirmalendu.kumar@vedanta.co.in	9950171201	
14	Dalpat Singh Chouhan	dalpat.chouhan@vedanta.co.in	9799397765	
15	Ranjan Gupta	manjan.gupta@vedanta.co.in	9799175999	

Venue- SDM, Office, Gulabpura.

Meeting OA -226/2020

Dated 13-07-2021 (13th July 2021)

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12	Vikas Singh JSO RPCB	rropcb.bhilwara@gmail.com	7054501786	[illegible]
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14	Laxmi Narayan	MB. Bhilwara@Rajasthan. gov.in	9660504682	[illegible]
15	M.S. Rawat	Sagwat Bhilwara gmail.com	9414621336	[illegible]

Head Office (CPM)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697

Registered

Annexure-II

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547

Date: 22/10/2019

Unit Id : 11060

M/s Hindustan Zinc Limited

(Rampura Agucha Mine), P.O.- Agucha, Bhilwara, ,
District:Bhilwara

Sub: **Consent to Operate** under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981**.**

Ref: Your application for Consent to Operate dated 30/10/2017 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) and under section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder **is hereby granted** for your **Lead Zinc Ore Beneficiation plant** situated at **PO- Agucha, District- Bhilwara Agucha Tehsil:Hurda District:Bhilwara** , Rajasthan, subject to the following conditions:-

1 That this Consent to Operate is valid for a period from **01/03/2018** to **28/02/2023** .

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
Beneficiation for Lead Zinc Ore	Activity	6.50 MILLION TONNES PER ANNUM

3 That this consent to operate is for existing plant, process & capacity and separate consent to establish/operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.

4 That the sources of air emmissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emmissions	Pollution Control Measures	Prescribed	
		Parameter	Standard

Head Office (CPM)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697

Registered

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547 **Date: 22/10/2019**
Unit Id : 11060

Primary Crusher New(750TON/HR)	ADEQUATE STACK HEIGHT , Bag Filter , WATER SPRAYERS , WET SCRUBBER , WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Primary Crusher Old(700TON/HR)	ADEQUATE STACK HEIGHT , Bag Filter , WATER SPRAYERS , WET SCRUBBER , WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Secondary Crusher(500TON/HR)	ADEQUATE STACK HEIGHT , Bag Filter , WATER SPRAYERS , WET SCRUBBER , WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Two DG Sets(5MW EACH)	ACOUSTIC ENCLOSURE , SAFE STACK HEIGHT AS PER ER IV	CO Particulate Matter NOx NMHC	150 mg/NM3 75 mg/NM3 710 ppm 100 mg/NM3

5 That the **Lead Zinc Ore Beneficiation plant** will comply with the standards as prescribed vide MOEF notification No. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality Standards.

Head Office (CPM)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697

Registered

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547
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6 That this consent to operate is valid for operation of Lead Zinc Ore Beneficiation plant of 6.5 Million Ton Per Annum capacity. The industry has to seek fresh consent to establish for any change in product/by product/process/service/activity and modification/alteration.

7 That total capital investment as on 30.09.2017 as per the C.A. certificate submitted by you is Rs. 846.09 Crore which includes the cost of Land, Building, Plant & Machinery and miscellaneous assets.

8 That the industry shall comply with all the conditions of Environmental Clearance (E.C.) issued by the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, vide letters no. J-11015/267/2008-IA.II(M) dated 11.12.2009.

9 That Hazardous Waste as defined under schedule IV of Hazardous & others Waste (Management, and Transboundary Movement) Rules, 2016 shall not be used as raw material without obtaining prior registration & authorization from the State Board.

10 That total water consumption/requirement for lead Zinc Ore Benification Plant shall not exceed to 9500 KLD which will be met from Banas Radial Wells.

11 That the industry shall comply with all the conditions of CGWA permission/NOC issued by Central Ground Water Authority, Ministry of water resource Govt of India vide letter no. 21-4(2)/WR/CGWA/2005-1205 dated 08.07.2013.

12 That water flow meters shall be provided and maintained at all suitable points to measure quantity of water received form Banas redial wells and water consumption for different purposes. Record of the same shall be maintained on daily basis.

13 That waste water generated from tailing dam will be reused/recycled completely in mill/process.

14 That the industry shall take utmost precaution to cater seepage from tailing dam and ensure complete recycle of seepage water in process only.

15 That the industry shall explore & carry out some scientific and technical study with reputed experienced organization in the field for catering of seepage from tailing dam.

16 That the industry shall get renewed NOC for abstraction of ground water from CGWA and submit to the State Board.

17 That the industry shall re-circulate the decanted water from the tailing dam and shall maintain Zero Discharge Status from tailing dam.

18 That the effluent from the ore benefication plant shall be treated to confirm to the prescribed standards and the tailing slurry shall be transported through a closed pipeline to the tailing dam.

19 That the industry shall maintain the stability and safety of the tailing dam as asssessed by CWPRS and NIRM.

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File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
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20 That no waste water (domestic & trade effluent) will be discharged inside or outside the factory premises in to a stream or well or sewer or on land in any case and complete zero discharge status shall be maintained.

21 That separate energy meter & hour meter shall be provided and maintained at all the air pollution control measures and record of daily running hours of pollution control measures and daily energy consumption shall be maintained in log book.

22 That for the control of fugitive emission guidelines / code of practice as issued by CPCB will be followed.

23 That at least four ambient air quality monitoring stations shall be established and maintained for PM-10, PM- 2.5, SOx & NOx monitoring.

24 That the industry shall maintain stack of adequate height at crusher and air pollution control measures shall be operated regularly and efficiently to achieve the prescribed emission standards as per condition no.4.

25 That adequate infrastructure facility for stack emission monitoring shall be maintained at the stack of crushers.

26 That stack of adequate height as per norms and acoustic enclosure shall be maintained with two DG Sets of 5 MW KVA each.

27 That no additional source of air emission shall be installed without prior consent from the State Board.

28 That all the raw materials and products shall be stored in closed sheds.

29 That cemented roads shall be provided and maintained properly inside the premises to minimize fugitive emissions due to vehicular movement.

30 That water sprinkling and cleaning of haul roads by vacuum cleaner shall be done regularly to control the fugitive emissions generated due to vehicular movement.

31 That dust suppression system shall be maintained to minimize fugitive dust emission in Lead Zinc Ore handing area & at various transfer points and closed conveyor belts shall be used for the transfer of material to reduce the fugitive emissions.

32 That the industry shall maintain dust collection and extraction system to control fugitive dust emissions at all the transfer points & loading/unloading areas.

33 That regular monitoring of ground water particularly in respect to heavy metals shall be carried out by establishing adequate numbers of peizeometric well around tailing dam.

34 That adequate arrangements shall be made to avoid flow of pollutants along with rain water.

Head Office (CPM)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697

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File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547 **Date: 22/10/2019**
Unit Id : 11060

35 **That the industry shall carryout effluent sampling/stack monitoring/ambient air quality monitoring and submit quarterly analysis report from the State Board laboratory/laboratory recognized by Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India.**

36 **That industry shall comply with the provisions of Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 & Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (as notified under Environment (Protection) Act, 1986 and record of daily hazardous waste generation and its disposal shall be maintained.**

37 **That the precautions/measures shall be taken for minimization of exposure to the workers involved in handling/processing of the lead and lead bearing material.**

38 **That the unit shall periodically examine their workers at least once in year for lead level in blood as well as urine. Persons with higher lead levels (greater than 40 µg/dl) should be shifted immediately to non–lead activity areas and given special medical treatment till the lead levels come back to acceptable level.**

39 **That the industry shall install and maintain adequately designed rain water harvesting structure for recharge of ground water in and around the area.**

40 **That the plantation of local species in the 33% of total area of the project shall be carried out & maintained.**

41 **That the industry shall get policy renewed from time to time under Public Liability Insurance Act (PLIA) and submit its copy to the Board.**

42 **That the industry shall obtain Environmental Clearance from competent authority under EIA Notification dated 14.09.2006 before establishing any such activity which attracts Environmental clearance under EIA Notification dated 14.09.2006.**

43 **That the industry shall submit the quarterly compliance report of all the above conditions to the State Board.**

44 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained **under section 27(2) of the Water Act and under section 21(6) of the Air Act** to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of **Air Act & Water Act**.

45 That the grant of this **Consent to Operate** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

Head Office (CPM)

Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004

Phone: 0141-5159600,5159695 Fax: 0141-5159697

Registered

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500

Order No : 2019-2020/CPM/5547

Date: 22/10/2019

Unit Id : 11060

46 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be instituted againt you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This **Consent to Operate** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act and Air Act** and to such other conditions as may, from time to time , be specified, by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Operate** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge[CPM]

(A): **Copy To:-**

1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bhilwara to inspect the unit and verify the compliance of consent conditions and submit the complete report with water analysis report of piezometic well including all parameters and all metals within 30 days.

2 Master File.

Group Incharge[CPM]

Head Office (Mines)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

Annexure-III

File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date: 25/06/2019**

Unit Id : 11,060

M/s Hindustan Zinc Limited

(Rampura Agucha Mine), P.O.- Agucha, Bhilwara,

District :Bhilwara

Sub: Grant of Consent to Operate under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981 and under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for your **Major Mineral** Mine at near Village-**Agucha**, Tehsil-**Hurda**, District- **Bhilwara (M.L.No-1/2000**).

Ref: (i) Your applications dated 30/10/2017
(ii) Received on 30/10/2017

Sir,

In view of the details submitted vide your above referred applications/ documents, the **Consent to Operate** under section 21(4) of Air (Prevention & Control of Pollution) Act,1981 and under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 is hereby granted for carrying mining activities. This consent is subject to the following stipulations:-

1 That this consent is being granted in favour of **M/s. Hindustan Zinc Limited,** a Mine of **Major Mineral** having **M.L.No**.- **1/2000 in an area measuring 1200.0000 Hectares** at/near Village-**Agucha** ,Tehsil-**Hurda**,District-**Bhilwara**.

2 That this consent is valid for a period from **01/03/2018** to **28/02/2023**

3 That this consent is valid for following mining activities :-

Mineral	Permitted Mining Capacity
1 Lead & Zinc Ore Mining	6.1500 MILLION TONNES PER ANNUM

4 That the project proponent will comply with the Standard as prescribed vide the Ministry of Environment, Forest and Climate Change notification no. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality standards.

Head Office (Mines)
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Phone: 0141-5159600,5159695Fax: 0141-5159697

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File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date:** **25/06/2019**

Unit Id : 11,060

5 That this consent to establish/consent to operate is only for carrying out mining of mineral/ore and not for any processing/benefication or crushing/grinding of ore/mineral for which a separate application for consent to establish and/or consent to operate should be submitted. The project proponent is required to obtain seprate consent to establish and consent to operate for carrying out mining of other minerals(s), if any or processing/beneficiation of such mineral(s) and for any addition/modification/alteration or change in process.

6 That this **Consent to Operate** is for mining / processing / beneficiation of product as mentioned above in **M.L.No.-1/2000** and a separate **Consent to Operate** is required to be obtained for any other Mineral mining/ processing/ beneficiation Plant/process if any and for any addition/ modification/ alteration or change in process.

7 **That the mine shall comply with all the conditions of the Environmental Clearance letter no. J-11015/267/2008-IA.II (M) dated 11/12/2009 issued by Ministry of Environment and Forest, Government of India.**

8 **That this consent to operate is valid for Lead & Zinc Ore Mining @ 6.15 million TPA. For any change in product and/or increase in capacity/lease area, the mine has to seek fresh Environmental Clearance, consent to establish & consent to operate.**

9 **That plantation shall be developed so as to cover at least 33% of the total land use for mining and allied activities as given in Approved Mining Plan and shall be maintained at all the time to maintain ambient air quality around the mine.**

10 **That mining operations shall be restricted to above ground water table and should not intersect ground water table. In case of working below the ground water table, prior approval of the Ministry of Environment, Forest& Climate Change and Central Ground Water Authority shall be obtained.**

11 **That the Mine shall comply with all the conditions of NOC granted by CGWA vide letter no. 21-4(258)WR/CGWA/2008-472 dated 28.04.2011.**

12 **That haul roads should be regularly graded and compacted. Regular water sprinkling should be carried out on haul roads to minimize dust generations.**

13 **That adequate measure shall be taken for control of fugitive emissions from the areas prone to air pollution.**

14 **That the total water consumption shall not exceed 2200 KLD without prior consent of the Board and permission from CGWA.**

15 **That the mine shall dispose its domestic waste water in scientific manner to avoid water pollution in and around the lease area.**

Head Office (Mines)

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4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697

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File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date:** **25/06/2019**

Unit Id : 11,060

16 **That no discharge of effluent shall be made within or outside the premises.**

17 **That the mine shall install suitable flow measuring devises/meters on the intake sources of the water and daily record of ground water abstraction and water consumption shall be maintained.**

18 **That the mine shall comply with provision of Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008.**

19 **That the mine shall install adequately designed rain water harvesting structure for prevention and recharge of ground water in and around the lease area.**

20 **That the mine shall not allow making any obstacles to any natural water flow i.e. natural nallah/steam carrying rain water to any water body.**

21 **That the mine shall not allow unauthorized disposal of any solid waste on land inside or outside the premises.**

22 **That this consent to operate shall be subject to compliance of direction/order passed by Courts of Law in the matter, if any.**

23 That all other general conditions enclosed as **Annexure** shall be strictly complied with.

24 That this Consent is subject to the conditions as stated above and general conditions as stated in Annexure. Further, the mining unit will comply with the provisions of the Air (Prevention & Control of Pollution) Act, 1981 & Water (Prevention & Control of Pollution) Act, 1974 and any such conditions as may be specified from time to time by the State Board under the provisions of the aforesaid Acts.

25 That the grant of this **Consent to Operate** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

26 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceedings, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

Head Office (Mines)

Rajasthan State Pollution Control Board
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Phone: 0141-5159600,5159695Fax: 0141-5159697

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File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date:** **25/06/2019**

Unit Id : 11,060

This bears approval of the competent authority.

Encl: As Above

Yours Sincerely

Group Incharge-Mines

Copy To:-

1 Director, Department of Mines & Geology, Government of Rajasthan, Shastri Circle, Udaipur..
2 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bhilwara - please ensure 100 percent compliance or standard norms and monitor time to time
3 Mining Engineer, Department of Mines & Geology, Government of Rajasthan, Bhilwara
4 Master File .

Group Incharge-Mines

RAJASTHAN STATE POLLUTION CONTROL BOARD
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

Annexure-IV

File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

M/s Hindustan Zinc Ltd.Rampura Agucha Mine
P.O. Agucha-311029 , Tehsil:Bhilwara
District:Bhilwara

Sub:- Authorization for operating a facility for Disposal, Generation, Storage, Transport of Hazardous Wastes Under Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016.

Ref:- Your application dated : 31/07/2019 received on 31/07/2019 and subsequent corresponde

Sir

1 Number of authorization RPCB/HWM/2019-2020/HSW/HSW/242.

2 Application Number : 246913 dated : 31/07/2019 .

3 **SBU DIRECTOR of M/s Hindustan Zinc Ltd.Rampura Agucha Mine is hereby granted an authorization based on the enclosed signed inspection report for Disposal, Generation, Storage, Transport of Hazardous waste on the premises situated at P.O. Agucha-311029 Tehsil: Bhilwara District: Bhilwara.**

Details of Authorization

SNo	Type of Hazardous waste	Category		Quantity/ Unit	Hazardous Waste Disposal Practice
		Sch	Code		
1	Discarded containers/Barrels/Liners used for hazardous wastes/chemicals	I	33.1	7000.00 NOS./ANNUM	CTDF Udaipur
2	Contaminated cotton rags or other cleaning materials	I	33.2	30.00 MTA	CTDF Udaipur
3	Sludge from treatment of waste water arising out of cleaning/disposal of barrels/containers	I	34.2	1.00 MTA	CTDF Udaipur
4	Used or spent oil	I	5.1	1500.00 KLA	Sales to Registered Recycler

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Registered

File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

5	Oil containing wastes / residues	I	5.2	50.00 MTA	CTDF Udaipur / Coincineration
6	Insulated Copper Wire Scrap/copper with PVC sheathing including ISRI-code material namely "Druid"	IV	7	150.00 MTA	Sales to Registered Recycler

4 The authorization shall be in force for period from **01/12/2019** to **30/11/2024** .

RAJASTHAN STATE POLLUTION CONTROL BOARD
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Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

The authorization is subject to the following general and specific conditions :

A. General conditions of Authorization

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

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

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.

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.

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;

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

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.

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

10. The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilisation of imported hazardous or other wastes shall be treated and disposed

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Phone: 0141-5159600,5159695Fax: 0141-5159697

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File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

of as per specific conditions of authorisation.

11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorisation shall be made as laid down under these Rules.
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.

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

B. Specific Conditions

5 **That this authorization shall ceased to be valid & shall be liable to be revoked without any furthor notice in case of refusal/expiry of consent to operate under the provisions of Water(Prevention and Control of Pollution) Act,1974 and Air(Prevention and Control of Pollution)Act,1981 by the State Board.**

6 **That no recycling/re-processing of the hazardous waste covered under schedule IV shall be carried out without prior authorisation from Rajasthan State Pollution Control Board as recycler/ re-processor of hazardous waste under the rule 6 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.**

7 **That no hazardous waste shall be utilized for co-processing as a supplementary resource or for energy recovery, or after processing without prior & valid approval of Central Pollution Control Board under the rule 9 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.**

8 **That in case of any expansion or change in process or product or change in mode / practice of disposal of hazardous waste or its quantity, industry shall obtain fresh authorization.**

9 **That the arrangements for transportation of the hazardous waste for disposal shall be done by the authorized/dedicated vehicles only and any environmental damages during Transportation shall be borne by sender/receiver whoever arrange the transportation.**

10 **That unit will submit Emergency Response Plan within one month.**

11 **That unit will conduct environmental monitoring of stack emission, ground water sampling, soil sampling by SPCB or EPA Notified lab in presence of SPCB officials and submit results within three months.**

RAJASTHAN STATE POLLUTION CONTROL BOARD
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Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

12 The authorization is subject to the conditions stated at Annexure "A" enclosed with the authorization letter and the such conditions as may be specified in the Rules for the time being forced under the Environmental (Protection) Act, 1986.

13 The unit has to display and maintain the data online outside the factory main gate in Hindi & English both on a 6'X 4' display board in the manner & format prescribed at Annexure "B" and the report of the Compliance along with photograph shall be submitted to this office & Regional Office, time to time.

14 That the annual reports/returns in the form prescribed under the Rules shall be submitted to the Board by 30th June of every year and records of hazardous waste Generation, handling & management shall be maintained according to the provisions of the Hazardous Waste (Management and Transboundary Movement) Rules, 2016 and shown & submitted to the Board as and when asked for.

15 The hazardous waste should not be stored for a period beyond 90 days, failing which the authorization shall deemed to be revoked.

16 It shall be ensured that the Hazardous waste is handled, managed & disposed of strictly in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016. Non compliance of the Rules or any of the conditions contained in the authorization shall be tantamount to automatic cancellation/revocation of the authorization.

17 The operator of the facility shall liable to comply any other conditions as per the guidelines isssued by the MoEF or CPCB or State Board related to collection, disposal, reception, storage & treatment of hazardous waste.

18 **That Authorization is issued under the provisions of Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with conditions laid down in all other for the time-being in force,rests with the industry/unit/project proponent.**

19 That this Authorization shall not, in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be instituted againt you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

RAJASTHAN STATE POLLUTION CONTROL BOARD
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

File No: F(HSW)/Bhilwara(Bhilwara)/1873(1)/2015-2016/4797-4799 **Date:-** 12/02/2020

Unit Id : 436

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge

Copy To:-

1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bhilwara you are requested to ensure the compliance of authorisation conditions under the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016

2 Master File

Group Incharge

Member Secretary

भारत सरकार
केन्द्रीय भूमि जल प्राधिकरण
जल संसाधन मंत्रालय

Government of India
Central Ground Water Authority
Ministry of Water Resources

CGWA/IND/Proj/2013-5 -R

No.21-4(2)/WR/CGWA/2005- 1205

Dated :- 08 JUL 2013

To,

M/s Hindustan Zinc Ltd.,
Rampur Agucha Mine
PO Agucha, District Bhilwara-311029
Rajasthan

Sub:- Renewal of NOC for ground water withdrawal to M/s Hindustan Zinc Ltd., in respect of their existing mining project at Rampura Agucha Mine, Kotri Block, District Bhilwara, Rajasthan – reg

Sir,

Kindly refer to letter No. HZL/RAM/ENV/2013 dated 25.2.2013 on the above cited subject. Based on recommendations of Regional Director, CGWB, Western Region, Jaipur vide his office letter No. TS/21B(5)/CGWA/WR/05-07-119-30 dated 22.3.2013 and subsequent letter dated 2.5.2013 and further deliberations on the subject, the further renewal of NOC issued vide this office letter of even no. dated 13.5.2008, is hereby accorded to **M/s Hindustan Zinc Ltd., in respect of their existing mining project at Rampura Agucha Mine, Kotri Block, District Bhilwara, Rajasthan**. The renewal is however subject to the following conditions:-

1. The firm may continue to abstract **11,700 m^3/day** of ground water through existing radial wells/tubewells only. No additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA.
2. Monitoring of the ground water extraction through wells to be continued through water meter by the industry at its own cost on regular basis, at least once in a month. The ground water quality to be monitored twice in a year during pre monsoon and post monsoon periods
3. **M/s Hindustan Zinc Ltd.,** shall, in consultation with the Regional Director, Central Ground Water Board, Western Region, Jaipur implement ground water recharge measures as proposed for augmenting the ground water resources under intimation to this office.

West Block - 2, Wing - 3, Sector - 1, R.K. Puram, New Delhi - 110066
Tel : 011-26175362, 26175373, 26175379 • Fax : 011-26175369
Website : www.cgwb.gov.in, www.mowr.gov.in

स्वच्छ सुरक्षित जल - सुन्दर खुशहाल कल
CONSERVE WATER - SAVE LIFE

vedanta
transforming elements

HZL/RAM/ENV/2018-19/26

Date: April 4, 2018

To,

The Regional Director,
Central Ground Water Board,
Western Region,
6-A, Jhalana Doongri,
JAIPUR

Sub: Request for renewal of Ground water withdrawal from existing Radial well at Banas River bed for M/s Hindustan Zinc Limited Rampura Agucha Mine.

Ref.: CGWA letters dated 08/07/2013 regarding renewal of NOC vide No. 21-4(2)/WR/CGWA/2005-1205 dated 08/07/2013.

Sir,

As per the condition No. 9 of the above mentioned NOC, "the renewal is valid for five years from date of issuance of the letter. Upon review of status of compliance of the conditions after five years, decision for revalidation of approval to be considered."

Accordingly, renewal form and compliance status of the conditions are attached herewith. It is to submit further that compliance of all the conditions stipulated in the NOCs is ensured.

Therefore it is humbly requested that this renewal for existing permission of drawl of 11700m3 /day ground water from the existing radial well to enable us to run our mine and beneficiation plant. We have deposited the processing fees of Rs. 500/- through "bharatkosh.gov.in" vide transaction reference No. 0404180001535 dated 04.04.2018. Copy of the same is attached herewith.

Your Faithfully

04/04/2018

(Rajendra Prasad Dashora)
Site President

CC to: Member Secretary,
Central Ground Water Authority
West Block-2, Wing-3
Sector-1, R.K. Puram,
NEW DELHI-110066

केन्द्रीय भूमि-जल प्राधिकरण
पश्चिमी क्षेत्र, जयपुर
आवक सं. 6/4/18
डायरी दिनांक

O/C Env.

Hindustan Zinc Limited
Rampura Agucha Mines, P.O. Agucha, Dist. Bhilwara (Rajasthan) - 311 022
M +91-9001294956-57, F +91-1483 229012 www.hzlindia.com

Registered Office : Yashad Bhawan, Udaipur (Rajasthan) 313 004
CIN No. L27204RJ1966PLC001208

CGWA renewal application

MINISTRY OF JAL SHAKTI

(Department Of Water Resources, River Development And Ganga Rejuvenation)

(CENTRAL GROUND WATER AUTHORITY)

NOTIFICATION

New Delhi, the 24th September, 2020

S.O. 3289(E).—WHEREAS, on the directions of Hon'ble Supreme Court vide its order dated the10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority (hereafter referred to as the 'Authority') vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under Section 5 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water management and development and to exercise certain powers and perform certain functions relating thereto;

AND WHEREAS, the Authority has been regulating ground water development and management by way of issuing 'No Objection Certificates' for ground water extraction to industries or infrastructure projects or Mining Projects etc., and framed guidelines in this connection from time to time in twenty two States and two Union territories, where ground water development is not being regulated by the State Government Union Territory administration concerned;

AND WHEREAS, some of the State Governments or, Union territories enacted legislations and issued regulatory directions or orders for regulating ground water development and management;

AND WHEREAS, the Hon'ble National Green Tribunal, New Delhi vide order dated the 15th April 2015 in OA Nos. 204/205/206 of 2014 has issued directions to the Authority to ensure that any person operating tube-well, or any means to extract ground water shall obtain permission from the Authority and shall operate the same subject to the law in force, even if such unit is existing unit or the unit is yet to be established;

AND WHEREAS, the said Hon'ble Tribunal vide its order dated the 09th July, 2015 in OA Nos. 34 and 37 of 2014 directed all industrial units which are members of the Common Effluent Treatment Plants (CETPs) to approach the Authority through State Pollution Control Board for obtaining 'No Objection Certificate' in accordance with the law;

AND WHEREAS, the aforesaid Hon'ble Tribunal vide order dated the 13th July, 2017 in OA No 200- of 2014 directed that every industry should be directed to pay for extraction of such water, that too, subject to the conditions stated in the order permitting such extraction;

AND WHEREAS, the said Hon'ble Tribunal vide its order dated the 28th August, 2018 in O.A. Nos. 176 of 2015 and 59 of 2012 respectively directed the Ministry of Water Resources, River Development and Ganga Rejuvenation to forthwith review the existing mechanism so as to ensure effective steps for conserving the groundwater resources;

AND WHEREAS, in pursuance of the directions of the Hon'ble National Green Tribunal and powers conferred by sub-section (3) of section 3 and section 5 of the Environment (Protection) Act, 1986 the Authority, with a view to protect the ground water resources had circulated the draft guidelines for grant of 'No Objection Certificate' on the 11th October, 2017 inviting comments and suggestions from all the stakeholders;

AND WHEREAS, all objections and suggestions received in response to the said draft guideline have been duly considered by the Central Government, the Authority notified the guidelines to regulate groundwater over-exploitation and to conserve the groundwater resources in the country vide notification number S.O. 6140 (E), dated the 12th December, 2018;

AND WHEREAS, the aforesaid Hon'ble Tribunal vide order dated the 03rd January 2019 in the OA No. 176 of 2015 directed that the above mentioned notification dated the 12th December, 2018 may not be given effect to as it is unsustainable if tested on 'Precautionary Principle, Sustainable development as well as Inter-generational Equity Principles' and if implemented, will result in fast depletion of groundwater and damage to water bodies and will be destructive of the fundamental right to life under Article 21 of the Constitution of India;

AND WHEREAS, the said Hon'ble Tribunal vide order dated the 11th September, 2019 constituted a committee to deliberate on steps for preventing depletion of groundwater, robust monitoring mechanism

against unauthorised extractions and fulfillment of 'No Objection Certificate' conditions, environment compensation etc and to submit a report;

AND WHEREAS, the aforesaid committee submitted the report along-with draft guidelines to regulate groundwater extraction and groundwater conservation in Hon'ble Tribunal on the 16th March, 2020;

AND WHEREAS, the above said Hon'ble Tribunal vide order dated the 20th July, 2020 directed to comply with certain points for sustainable groundwater management while issuing 'No Objection Certificates' to commercial establishments by the Authority;

Now therefore, in pursuance of the directions of Hon'ble National Green Tribunal and the powers conferred by sub-section (3) of Section 3 read with Section 5 of the Environment (Protection) Act, 1986 (29 of 1986), the Department of Water Resources, River Development & Ganga Rejuvenation, hereby notifies the guidelines to regulate and control groundwater extraction in the country in supersession to this Ministry notification vide S.O. 6140 (E), dated the 12th December, 2018 as per the Schedule below:

SCHEDULE

Guidelines to regulate and control ground water extraction in India

(with immediate effect)

INDEX

[F. No. CGWA-21/4/2020-CGWA]

ASHISH KUMAR, Director

ANNEXURES

Annexure I: Estimation of water requirements for drinking and domestic use.

Annexure II: Guidelines for construction of piezometers and monitoring of groundwater levels and quality.

Annexure III: Measures to be adopted to ensure prevention from pollution in the plant premises of polluting industries/ projects.

Annexure IV: Outline of hydro-geological report for obtaining No Objection Certificate for industries.

Annexure V: Format of the Report on ground water conditions (for mining projects).

Annexure VI: Indicative list of Infrastructure projects.

Annexure VII: Supreme Court Order in Civil Writ petition 36 of 2009 regarding measures for prevention of fatal accidents of small children due to their falling into abandoned bore wells and tube wells.

Annexure VIII: List of States/ Union territories where ground water extraction is being regulated by Central Ground Water Authority (CGWA)

Annexure IX: Glossary of technical terms used

Annexure X : Annual water audits by the industries

Guidelines to regulate and control groundwater extraction in India

Preamble and Background:

On the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government had constituted the Central Ground Water Board as Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

The Authority has been regulating ground water development and management by way of issuing 'No Objection Certificates' for ground water extraction to industries or infrastructure projects or Mining Projects etc., and framed guidelines in this connection from time to time applicable in twenty two States and two Union territories, where ground water development is not being regulated by the State Government and Union territory administration concerned.

To have sustainable management of water resources in the country groundwater abstraction guidelines have been prepared to regulate groundwater extraction and conserve the scarce groundwater resources in the country.

These guidelines will come into force with immediate effect from the date of Gazette Notification and will supersede all earlier guidelines issued by the Central Ground Water Authority (CGWA).

These guidelines will have pan India applicability. Ground water abstraction in States/ Uts (which are not regulating ground water abstraction) shall continue to be regulated by Central Ground Water Authority.

Further, wherever States/ Uts have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ Uts contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.

All new/existing industries, industries seeking expansion, infrastructure projects and mining projects abstracting ground water, unless specifically exempted under Para 1.0 below, will be required to seek No Objection Certificate from Central Ground Water Authority or, the concerned State/ UT Ground Water

Authority as the case may be. The entire process of grant of No Objection Certificate shall be online through a web based application system.

Water management plans shall be prepared by all the State Ground Water Authorities/ Organizations for all Over-exploited, Critical and Semi-critical assessment units starting with Over-exploited units. Water management plans shall be reviewed and updated periodically. Water management plans, data on water availability and scarcity and policy framed in this regard shall be placed on the websites of Central Ground Water Authority/ State Ground Water Authority.

1.0 Exemptions from seeking No Objection Certificate:

Following categories of consumers shall be exempted from seeking No Objection Certificate for ground water extraction:

(i) Individual domestic consumers in both rural and urban areas for drinking water and domestic uses.

(ii) Rural drinking water supply schemes.

(iii) Armed Forces Establishments and Central Armed Police Forces establishments in both rural and urban areas.

(iv) Agricultural activities.

(v) Micro and small Enterprises drawing ground water less than 10 cum/day.

1.1 Registration of Drilling Rigs

State / Ut Governments shall be responsible for registering drilling rigs operating within their jurisdiction and for maintaining the database of wells drilled by them. Appropriate link shall be provided in CGWA portal for making the data available to CGWA.

2.0 Drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas

For grant of No Objection Certificate for ground water extraction, the project proponent has to furnish the details as per the guidelines issued by the CGWA in proper format as available in CGWA website. No Objection Certificate for new /existing wells shall be granted only in such cases where the local Government water supply agency is unable to supply requisite amount of water in the area.

No Objection Certificate shall be granted subject to the following specific conditions:

i) Installation of Sewage Treatment Plants shall be mandatory for all residential apartments/ Group Housing Societies where ground water requirement is more than 20 m^3/day. The water from Sewage Treatment Plants shall be utilized for toilet flushing, car washing, gardening etc.

ii) The No Objection Certificate shall be valid for a period of five years from the date of issue or till such time local Government water supply is provided to the project area, whichever is earlier. In case the project proponent receives water supply from the concerned local Government Water Supply Agency during the validity of the No Objection Certificate, intimation regarding availability of public water supply shall be sent by the project proponent to CGWA and No Objection Certificate will be cancelled by the Authority. In other cases, the project proponent will apply for renewal of No Objection Certificate, ninety days before the expiry of No Objection Certificate.

iii) Proponents shall be liable to pay ground water abstraction charges for the quantum of ground water proposed to be extracted, as per rates mentioned in Table 5.1.

Documents to be submitted with the application

a) Details of water requirement computed as per National Building Code, 2016 **(Annexure I)**, taking into account recycling/ reuse of treated water for flushing etc.

b) Affidavit on non-judicial stamp paper of Rs. 10/- by the applicant, confirming non/ inadequate availability of public water supply in case of users requiring ground water up to 10 m^3/ day for drinking/ domestic use.

c) Certificate of non-availability of water from local government water supply agency in cases requiring ground water in excess of 10 m^3/ day for drinking/ domestic use. Government water supply agencies

applying for No Objection Certificate shall submit copy of government approval of the scheme/ project proposed to be implemented.

d) Ground water quality data of existing bore well/ tube well/ dug well from any National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratory or Govt. approved laboratory (in case of existing projects applying for no objection certificate)

e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

3.0 Agriculture Sector

Agriculture sector is the backbone of the Indian economy. As per Minor Irrigation Census 2013-14, 87.86% of wells are owned by marginal, small and semi-medium farmers having land holding up to 4 hectares (ha). Around 9.18 % of wells are owned by medium farmers having land holding 4 – 10 ha and 2.96% of the wells are owned by big farmers having land holding more than 10 ha.

Considering the number of ground water abstraction structures, regulation of ground water in agriculture sector through a 'command and control' strategy will prove to be an arduous task. Therefore, a participatory approach for sustainable ground water management would be more productive.

States/Uts are advised to review their free/subsidized electricity policy to farmers, bring suitable water pricing policy and may work further towards crop rotation/diversification/other initiatives to reduce over-dependence on groundwater.

Agriculture sector shall be exempted from obtaining No Objection Certificate for ground water extraction.

4.0 Commercial Use

No new major industries shall be granted No Objection Certificate in over-exploited assessment areas except as per the policy guidelines.

Availability of ground water resources shall be given due regard while considering applications for grant of No Objection Certificate for commercial use.

Commercial entities extracting ground water shall be required to submit online annual water audit report including an audit of water use as mentioned in the relevant sections. CGWA/ State Ground Water Authority (SGWA) shall publish all such audit reports online.

CGWA/ SGWAs shall engage independent agencies to verify the compliance of No Objection Certificate conditions periodically.

4.1 Industrial Use

In Over-exploited assessment units, No Objection Certificate shall not be granted for ground water abstraction to any new industry except those falling in the category of Micro, Small and Medium Enterprises (MSME). However, No Objection Certificate for drinking/ domestic use for work force, green belt use by these new industries shall be permitted. Expansion of existing industries involving increase in quantum of ground water abstraction in over-exploited assessment units shall not be permitted. No Objection Certificate shall not be granted to new packaged water industries in Overexploited areas, even if they belong to MSME category.

No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:

i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.

ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.

iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be

required to reduce their ground water use by at least 20% over the next three years through appropriate means.

iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in Section 15 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 15 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Detailed guidelines for design and construction of piezometers are given in **Annexure II**. Monthly water level data shall be submitted to the CGWA through the web portal.

v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.

vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.

vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution **(Annexure III).**

viii) All industries drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Tables 5.2 A and 5.3 A.

ix) All existing industries drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as applicable as per Tables 5.2 B and 5.3 B.

Documents to be submitted with the application

(a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day.

(b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the local government water supply agency in cases where requirement of ground water is more than 10 m^3/day.

(c) Ground water quality data of existing bore well/ tube well/ dug well from any NABL accredited laboratory or Govt. approved laboratory (in case of existing projects applying for No Objection Certificate)

(d) Water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.

(e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(f) **Impact Assessment report:** All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in **Annexure IV.**

4.2 Mining Projects

All existing as well as new mining projects will be required to obtain No Objection Certificate for ground water abstraction. Since mining projects are location specific, there will be no ban on grant of No Objection Certificate for abstraction of ground water for such projects in over-exploited assessment units.

No Objection Certificate for mining projects shall be granted subject to the following specific conditions:

i) It shall be mandatory for all the mining industries to ensure that water available from de-watering operations is properly treated and should be gainfully utilized for supply for irrigation, dust

suppression, mining process, recharge in downstream and for maintaining e-flows in the river system.

ii) Construction of observation well(s) (piezometers) along the periphery in the premises, for monthly ground water level monitoring, shall be mandatory for mines drawing/ proposing to draw more than 10 m^3/day of ground water. Depth and aquifer zone tapped in the piezometer shall be commensurate with that of pumping well/ wells.

iii) In addition, the proponent shall monitor ground water levels by establishing observation wells (piezometers) in the core and buffer zones as specified in the No Objection Certificate.

iv) In case of coal and other base metal mining the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

v) In addition to this, all mining units shall also monitor the water quality of mine seepage and mine discharge through NABL accredited/ Govt. approved laboratories and the same shall be submitted at the time of self compliance.

vi) All mining projects drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Tables 5.4 A.

vii) All mining projects drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as per Table 5.4 B.

Documents to be submitted with the application

(a) Mining plan approved by the concerned Govt. agency/ department.

(b) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(c) Comprehensive report prepared by accredited consultant on ground water conditions in both core and buffer zones of the mine, depth wise and year wise mine seepage calculations, impact assessment of mining and dewatering on ground water regime and its socio-economic impact, details of recycling, reuse and recharge, reduction of pumping with use of technology for mining and water management to minimize and mitigate the adverse impact on ground water, based on local conditions. Format for report is given in **Annexure V.**

4.3 **Infrastructure projects:**

Since infrastructure projects are location specific, grant of No Objection Certificate to such projects located in over-exploited assessment units shall not be banned. New infrastructure projects/ residential buildings may require dewatering during construction activity and/ or use ground water for construction. In both cases, applicants shall seek No Objection Certificate from CGWA before commencement of work. However, in over-exploited assessment units, use of ground water for construction activity shall be permitted only if no treated sewage water is available within 10 km radius of the site. New as well as existing Infrastructure projects shall also be required to seek No Objection Certificate for abstraction of ground water.

No 'No Objection Certificate' shall be granted for extraction of groundwater for Water Parks, Theme Parks and Amusement Parks in over-exploited assessment units.

Indicative list of Infrastructure projects is given in Annexure VI.

The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:

i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data through the web portal to CGWA/SGWA as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by CGWA/ SGWA.

ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3/day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

iii) For infrastructure dewatering/ construction activity, No Objection Certificate shall be valid for specific period as per the detailed proposal submitted by the project proponent.

iv) All infrastructure projects drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Table 5.3 A.

v) All infrastructure projects (new/ existing) drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as per Table 5.3 B.

Documents to be submitted with the application

(a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.

(b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.

(c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in critical and over-exploited areas.

(d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.

(e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(f) Details of water requirement computed as per National Building Code, 2016 **(Annexure I)**, taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).

(g) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.

5.0 Ground water abstraction/ restoration charges

All residential apartments/ group housing societies/ Government water supply agencies in urban areas shall be required to pay ground water abstraction charges.

All industries/mining/ infrastructure projects drawing ground water in safe, semi-critical and critical assessment units will have to pay ground water abstraction charges based on quantum of ground water extraction and category of assessment unit as per details given in this guideline.

All existing mining/ infrastructure projects and existing industries including MSME drawing ground water in over-exploited assessment units will have to pay ground water restoration charges based on quantum of ground water extraction. Further, new MSME, new infrastructure and new Mining projects in over exploited areas shall also be required to pay ground water restoration charges.

Existing industries, infrastructure units and mining projects which have installed/constructed artificial recharge structures in compliance of the conditions prescribed in the groundwater guidelines prevailing at the time of grant of No Objection Certificate or its renewal shall be eligible for a rebate of 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, subject to their satisfactory performance and verification.

The revenue generated from the proposed water abstraction/ restoration charges shall be kept in a separate fund for implementation of site specific suitable demand/ supply side interventions.

5.1 **Rates of Ground water abstraction /restoration charges**

I. **Drinking and domestic use for residential apartments/ group housing societies/ Government water supply agencies in Urban areas**

All residential apartments/ Group Housing Societies requiring water only for drinking/domestic use requiring No Objection Certificate would pay ground water abstraction charges as per rates given below in **Table 5.1.**

Table 5.1 Ground Water Abstraction charges for Drinking & Domestic use.

Quantum of Groundwater withdrawal (m^3/month)	**Rate of ground water abstraction charges (Rs. per m^3)**
0-25	No charge
26-50	1.00
>50	2.00

Government water supply agencies and Government infrastructure projects shall pay Ground water abstraction Charges @ Rs. 0.50 per m^3.

II. **Packaged Drinking Water units**

Rates of ground water abstraction charges for packaged drinking water units in safe, semi-critical and critical assessment units are given in Table 5.2 A and those for ground water restoration charges in over-exploited assessment units are given in Table 5.2 B.

Table 5.2 A: Rates of ground water abstraction charges for packaged drinking water units (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal				
		Up to 50m^3/day	51 to <200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	3.00	5.00	8.00	10.00
2.	Semi-critical	2.00	5.00	10.00	15.00	20.00
3.	Critical	4.00	10.00	20.00	40.00	60.00

Table 5.2 B: Rates of ground water restoration charges for packaged drinking water units (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal				
		Up to 50 m^3/day	51 to <200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited (existing industries only)	8.00	20.00	40.00	80.00	120.00

III. **Other Industries & infrastructure projects**

Rates of ground water abstraction charges for other industries and infrastructure projects in safe, semi-critical and critical assessment units are given in Table 5.3 A and those for ground water restoration charges in over-exploited assessment units are given in Table 5.3 B.

Table 5.3 A: Rates of Ground Water abstraction charges for other industries & infrastructure projects (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	2.00	3.00	5.00
2.	Semi-critical	2.00	3.00	5.00	8.00
3.	Critical	4.00	6.00	8.00	10.00

Table 5.3 B: Rates of ground water restoration charges for other industries & infrastructure projects (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited (existing industries / new Industries as per the present Guidelines)	6.00	10.00	16.00	20.00

IV. **Mining projects**

Rates of ground water abstraction charges for mining, which are drawing ground water in safe, semi-critical and critical assessment units are given in Table 5.4 A and those for ground water restoration charges in case of projects drawing ground water in over-exploited assessment units are given in Table 5.4 B.

Table 5.4 A: Rates of ground water abstraction charges for mining (Rs. per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	2.00	2.50	3.00
2.	Semi-critical	2.00	2.50	3.00	4.00
3.	Critical	3.00	4.00	5.00	6.00

Table 5.4 B: Rates of ground water restoration charges for mining (Rs. per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited	4.00	5.00	6.00	7.00

6.0 Bulk Water Supply

All private tankers abstracting ground water and use it for supply as bulk water suppliers will now mandatorily seek No Objection Certificate for ground water abstraction. The bulk water suppliers through tankers drawing ground water in safe, semi-critical and critical assessment units shall pay groundwater abstraction charges as per the **Table-6.1 A.** The bulk water suppliers drawing ground water in over-exploited assessment units shall pay the groundwater restoration charges as per the **Table-6.1 B.** All tankers will have to install GPS based system for their monitoring of movement/area of operation.

Modalities for issue of No Objection Certificate for bulk/tanker water supplies shall be worked out in consultation with States/Uts and suitable guidelines in this regard will be framed and issued separately for the same.

Table-6.1A: Groundwater abstraction charges for Bulk/Tanker water supplies	
Category	Rate per m3 (in Rs.)
Safe	**10**
Semi Critical	**20**
Critical	**25**

Table-6.1B: Groundwater abstraction charges for Bulk/Tanker water supplies	
Category	Rate per m3 (in Rs.)
Over Exploited	**35**

7.0 Abstraction of Saline ground water

Abstraction of saline ground water in areas having either saline ground water at all depths or pockets of saline ground water in an otherwise fresh water area for use by industries/ dewatering by infrastructure/ mining projects including those located in over-exploited areas would be encouraged. Such industries shall be exempted from paying ground water abstraction charges.

The list of such assessment units having saline ground water at all depths as per the latest assessment of dynamic ground water resources will be made available by the CGWA in their website. However, due care shall be taken in respect of disposal of effluents by the units so as to protect the water bodies and the aquifers from pollution.

Detailed guidelines in this regard shall be prepared and issued separately.

8.0 Protection of Wetland Areas

The wet land areas in the country are very crucial as they are direct reflection of the presence of ground water in such areas. The protection of the wetland areas is being separately handled by the Wetland Authorities. Since ground water is very crucial for the survival of the wetland area, any excessive ground water development within the zone of wetland area would affect the volume of water in that wetland.

Projects falling within 500 m. from the periphery of demarcated wetland areas shall mandatorily submit a detailed proposal indicating that any ground water abstraction by the project proponent does not affect the protected wetland areas. Furthermore, before seeking permission from CGWA, the projects shall take consent/approval from the appropriate Wetland Authorities to establish their projects in the area.

9.0 General compliance conditions in No Objection Certificate

i. Installation of digital water flow meter (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate through the web-portal.

ii. Proponents shall mandatorily get water flow meter calibrated on from an authorized agency once in a year.

iii. Proponents shall install roof top rain water harvesting & recharge systems in the project area.

iv. Proponents shall pay Ground Water Abstraction/ Restoration Charges based on quantum of ground water extraction as applicable as per the rates given in Section 6.

v. Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 15. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in **Annexure-II.**

vi. Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

vii. If the existing well becomes defunct due to mechanical failure within the validity period of No Objection Certificate, the user can construct a replacement well under intimation to CGWA on web portal. The defunct well shall be properly sealed **(Refer Annexure VII).** The user will be required to submit documentary proof in this regard. However, if the existing abstraction structures fails to yield water and he proponent desires to drill another tubewell in the same premises, prior permission of the Authority shall be required. If the replacement well is to be drilled in some different place, the proponent shall obtain fresh No Objection Certificate.

viii. Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

ix. In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

10.0 Monitoring of compliance of No Objection Certificate Conditions

To monitor the compliance of No Objection Certificate conditions, Central Ground Water Authority and State/ UT Ground Water Authorities shall take the following steps:

a. Suitable MIS will be developed for compliance monitoring.

b. District Collectors/Deputy Commissioners (DCs) /District Magistrates (DMs) are authorized to take enforcement measures like sealing of unauthorized ground water abstraction structures, disconnection of electricity, launching of prosecution against those violating the No Objection Certificate conditions and taking action for imposition of Environmental Compensation.

c. Technical officers of CGWB/ CGWA and State groundwater organizations are authorized to take actions with respect to monitoring and periodic inspections with the approval of competent authority.

d. In case of violation of any of the No Objection Certificate conditions, the proponents shall be liable to pay the penalties as per **Section 16.**

11.0 Renewal of No Objection Certificate

No objection certificate shall be renewed periodically, subject to the compliance of the conditions mentioned therein:

i. The applicant shall apply for renewal of No Objection Certificate at least ninety days prior to expiry of its validity.

ii. Application for renewal of No Objection Certificate shall be accompanied by the Compliance Report.

iii. Before granting renewal, Central Ground Water Authority or State/ Ut Authority shall satisfy itself that the conditions of No Objection Certificate have been complied with.

iv. In case of change in category of the assessment unit, renewals would be granted with conditions as laid down for new category.

v. No Objection Certificate will be renewed for the terms specified for various uses as follows:

Category	Use	Term of renewal
Critical, Semi-critical and safe	Infrastructure projects for drinking & domestic use and urban Water Supply Agencies	5 years
	Industries	3 years
	Mines	2 years
Over exploited	All users in 'Over-exploited areas'	2 years

vi. If the application for renewal is submitted in time and the CGWA/ the respective State/ Ut Authority is unable to process the application in time, No Objection Certificate shall be deemed to be extended till the date of renewal of No Objection Certificate.

vii. If the proponent fails to apply for renewal within 3 months from the date of expiry of No Objection Certificate, the proponent shall be liable to pay Environmental Compensation for the period starting from the date of expiry of No Objection Certificate till No Objection Certificate is renewed by the competent authority.

12.0 Extension of No Objection Certificate

If the proponent is unable to construct the well(s) during the validity period of No Objection Certificate for genuine reasons, the proponent will have to apply for extension of No Objection Certificate. Application for extension should be supported by documents justifying the reasons for delay. Other conditions for grant of extension of No Objection Certificate will be the same as that for fresh No Objection Certificate.

Extension of No Objection Certificate will be granted for a maximum period of two years. No further extension will be granted after the expiry of the extended period. In that case, the applicant will have to apply afresh for grant of No Objection Certificate.

13.0 Delegation of powers against illegal groundwater withdrawal

Central Ground Water Authority has appointed the District Magistrate/ District Collector/ Sub Divisional Magistrates of each Revenue District/Sub division as Authorized Officers, who have been delegated the power to seal illegal wells, disconnect electricity supply to the energised well, launch prosecution against offenders etc. including grievance redressal related to ground water in their respective jurisdictions.

In order to further decentralise and strengthen the monitoring and compliance mechanism as per the guidelines, officials of concerned Departments of Revenue and Industries of the States/Uts shall be appointed as Authorised Officers in consultation with the State/Ut Governments.

A copy of the No Objection Certificate issued by the CGWA in the No Objection Certificate Application Portal (NOCAP) will be forwarded to the respective District Magistrate/ District Collector. In case of any violation of the directions of Central Ground Water Authority and non-fulfilment of the conditions laid

down in the No Objection Certificate, the Authorised Officers will file appropriate Petition/Original Application etc under sections 15 to 21 of the Environment (Protection) Act, 1986 in appropriate Courts.

14.0 Ground Water Level Monitoring

All the project proponents (drawing ground water more than 10 cum/d) have to mandatorily construct Piezometers (observation wells) within their premises for monitoring of the ground water levels. Such a mechanism of compliance conditions has been made to ensure that every month the ground water level in the project area can be monitored and observed. In this regard the necessary criteria for monitoring of water levels through piezometers by the project proponents is given in Table 14.1.

Table 14.1 No. of Piezometers to be constructed & Type of Water Level Monitoring Mechanism

S.No.	Quantum of Ground water withdrawal (cum/d)	No. of piezometer required	Monitoring mechanism		
			Manual	DWLR	DWLR with Telemetry
1	<10	0	0	0	0
2	11-50	1	1	0	0
3	51-500	1	0	1	0
4	>500	2	0	1	1

The piezometer shall be suitably located to ensure that zone of aquifer tapped in the piezometer is the same as that of the pumping well.

15.0 Environmental Compensation

Extraction of ground water for commercial use by industries, infrastructure units and mining projects without a valid No Objection Certificate from appropriate authority shall be considered illegal and such entities shall be liable to pay Environmental Compensation for the quantum of ground water so extracted. The norms prescribed by Central Pollution Control Board (CPCB) shall be utilized for calculating the Environmental compensation as mentioned below:

EC_{GW} = Ground water consumption per day x Environmental Compensation rate (ECR_{GW}) x No. of days x Deterrence factor

where ground water consumption is in m3/day and ECR_{GW} in Rs./ cum

15.1 Rates of Environmental Compensation:

Rates of Environmental Compensation (ECR_{GW}) for various types of users in different categories of assessment units are given in Table 15.1 to 15.3.

Table 15.1 : ECR_{GW} for Packaged Drinking Water units

S.No.	Area Category	Water Consumption (cum/day)			
		<200/	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
	Safe	12	18	24	30
2	Semi critical	24	36	48	60
3	Critical	36	48	66	90
4	Over- exploited	48	72	96	120
Note :-Minimum EC_{GW} shall not be less than Rs 1,00,000/-					

Table 15.2: ECR_{GW} for Mining/ infrastructure dewatering projects

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
1	Safe	15	21	30	40
2	Semi critical	30	45	60	75
3	Critical	45	60	85	115
4	Over- exploited	60	90	120	150
Note :-Minimum EC_{Gw} shall not be less thanRs 1,00,000/-					

Table 15.3: ECR_{GW} for Industrial units

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
1	Safe	20	30	40	50
2	Semi critical	40	60	80	100
3	Critical	60	80	110	150
4	Over- exploited	80	120	160	200
Note :-Minimum EC_{Gw} shall not be less thanRs 1,00,000/-					

15.2 Deterrent Factors to compensate losses and environmental damage (for packaged drinking water units, mining, industries and infrastructural dewatering projects)

The following deterrent factors based on the duration of illegal ground water extraction shall be levied to compensate for the losses and environmental damages as detailed in Table 15.4.

Table 15.4: Deterrent factor based on quantum of ground water withdrawal and number of years of illegal withdrawal

S.No.	Water Consumption	Deterrence Factor		
		< 2 years	2-5 years	>5 years
1	<1000 KLD	1.00	1.00	1.25
2	1000-5000 KLD	1.00	1.00	1.50
3	>5000 KLD	1.00	1.25	2.00

Note: KLD – Kilolitre per day

16.0 Provision of Penalty

Penalty shall be imposed on the proponents for non-compliance of No Objection Certificate conditions issued by the appropriate authority. Rates of penalty proposed for non-compliance of various conditions of No Objection Certificate are given in Table 16.1.The rates of the penalty shall be reviewed periodically with the approval of competent authority in Ministry of Jal Shakti.

Table 16.1: Penalty provision for non Compliance of No Objection Certificate conditions

S. No.	**Items**	Charges in Rs.
1	Non installation/faulty Digital water Flow meter with telemetry system.	200000
2	Non disclosure/ construction of additional groundwater abstraction structures a) Non-functional Structures. b) Defunct/Abandoned Note: Given rates are for unit non-functional/defunct/abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty.	 200000 100000
3	Reporting of fresh water zones as Brackish / Saline zones in application.	200000
4	Non Installation of Piezometer.	200000
5	Non Installation/faulty DWLR/Telemetry system	100000
6	Non Construction/Inadequate capacity of Recharge / Water conservation structures.	500000
7	Non maintenance of Recharge structures.	200000
8	Injection of treated/untreated water into the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquifer remediation as per the provisions of Environment (Protection) Act, 1986.	1000000
9	Non Submission of Water level/Water quality Data.	50000
10	Non-maintenance of log book of daily withdrawal/non submission of Groundwater abstraction data.	50000
11	Non submission of photograph of recharge structure(s).	50000
12	Non Submission of Self Compliance report.	100000
13	Construction of groundwater abstraction structures by un authorized/unregistered Drilling Rigs (per structures).	100000
14	Non registration of water supply tankers.	500000
15	Submission of false information/ undertaking.	100000

Charges shall also be payable for correction/modification in the existing issued No Objection Certificate letter. The details of such charges are given in Table 16.2.

Table 16.2: Proposed Charges for correction/Modification in the existing issued No Objection Certificate

S. No.	**Items**	Charges in Rs.
1	Change in recharge quantum	10000
2	Change in User ID.	5000
3	Change in firm Name	5000
4	Extension of No Objection Certificate	5000
5	Issuance of duplicate No Objection Certificate	5000
6	Issuance of corrigendum to No Objection Certificate	5000
7	Any other items/corrections etc	5000

17.0 Other important Conditions (Applicable to all):

i. Sale of ground water by a person/ agency not having valid no objection certificatefrom CGWA/State Ground Water Authority is not permitted.

ii. In infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

iii. In case of Infrastructure projects, the firm/entity shall ensure implementation of dual water supply system in the projects. Compliance of the same shall be submitted through the web portal.

iv. Non-compliance of conditions mentioned in the No Objection Certificate may be taken as sufficient reason for cancellation of no objection certificate accorded/ non-renewal of No Objection Certificate.

v. No application shall be entertained without supporting documents as specified in relevant sections.

vi. Abstraction structure(s) should be located inside the premises of project property.

vii. Self compliance of conditions laid down in the no objection certificate shall be reported by the users online in the web portal of Central Ground Water Authority/state Ground Water Authority.

viii. Processing fee prescribed, if any, from time to time shall be charged for various services.

Note:

1. Guidelines are subject to modification from time to time.

2. In case of any discrepancy between Hindi and English versions of this document including the annexures, the English version shall prevail.

Annexure I

Estimation of Water Requirements for drinking and domestic use

(Source: National Building Code 2016, BIS)

a) Residential Buildings:

Accommodations	Population
1 Bedroom dwelling unit	4
2 Bedroom dwelling unit	5
3 Bedroom dwelling unit	6
4 Bedroom dwelling unit and above	7

Notes:

1) The above figures consider a domestic household including support personnel, wherever applicable.

2) For plotted development, the population may be arrived at after due consideration of the expected number and type of domestic household units.

3) Dwelling unit under EWS category shall have population requirement of 4 and studio apartment shall have population requirement of 2.

As a general rule the following rates per capita per day may be considered for domestic and non-domestic needs:

a) For communities with populations up to 20,000:

1)	Water supply through stand post:	40 lphd (Min)
2)	Water supply through house service: connection	70 to 100 lphd

b) For communities with: 100 to 135 lphd
population 20,000 to 100,00 together with
full flushing system

c) For communities with population: 150 to 200 lphd
above 100,000 together with
full flushing system

Note—The value of water supply given as 150 to 200 litre per head per day may be reduced to 135 litre per head per day for houses for Medium Income Group (MIG) and Low Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions and availability of water.

Out of the 150 to 200 litre per head per day, 45 litre per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

A. **Water Requirements for Buildings Other than Residences**

Sl No.	Type of Building	Domestic litres per head/ day	Flushing Litres per head/ day	Total Consumption Litres per head/ day
1.	Factories including canteen where bath rooms are required to be provided	30	15	45
2.	Factories including canteen where no bath rooms are required to be provided	20	10	30
3.	Hospital (excluding laundry and kitchen): a) Number of beds not exceeding 100	230	110	340
	b) Number of beds exceeding 100	300	150	450
	c) Out Patient Department (OPD)	10	5	15
4.	Nurses' homes and medical quarters	90	45	135
5.	Hostels	90	45	135
6.	Hotels (up to 3 star) excluding laundry, kitchen, staff and water bodies	120	60	180
7.	Hotels (4 star and above) excluding laundry, kitchen, staff and water bodies	260	60	320
8.	Offices (including canteen)	25	20	45
9.	Restaurants and food court including water requirement for kitchen: a) Restaurants	55 per seat	15 per seat	70 per seat
	b) Food Court	25 per seat	10 per seat	35 per seat
10.	Clubhouse	25	20	45
11.	Stadiums	4	6	10

12.	Cinemas, concert halls and theatres and multiplex	5 per seat	10 per seat	15 per seat
13.	Schools/Educational institutions: a) Without boarding facilities b) With boarding facilities	25	20	45
		90	45	135
14.	Shopping and retail (mall) a) Staff	25	20	45
	b) Visitors	5	10	15
15.	Traffic Terminal stations a) Airports	40	30	70
	b) Railway stations (Junction) with bathing facility	40	30	70
	c) Railway stations (Junction) without bathing facility	30	15	45
	d) Railway stations (Intermediate) with bathing facility	25	20	45
	e) Railway stations (Intermediate) without bathing facility	15	10	25
	f) Interstate bus terminals	25	20	45
	g) Intrastate Bus Terminals/Metro Stations	10	5	15

Notes:

1. For calculating water demand for visitors, consumption of 15 litre per head per day may be taken.

2. The water demand includes requirement of patients, attendants, visitors and staff. Additional water demand for kitchen, laundry and clinical water shall be computed as per actual requirements.

3. The number of persons shall be determined by average number of passengers handled by stations, with due considerations given to the staff and vendors who are using these facilities.

4. Consideration should be given for seasonal average peak requirements.

5. The hospitals may be categorized as Category A (25 to 50 beds), Category B(51 to 100 beds), Category C (101 to 300 beds), Category D (301 to 500) and Category E (501 to 750 beds).

Annexure II

Guidelines for construction of Piezometers and monitoring of Ground Water Levels and Quality

Piezometer is a borewell/tubewell used only for measuring the water level by lowering a tape/sounder or automatic / digital water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum distance of 50 m from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about four inches to six inches.

- The depth of the piezometer should be the same as that of the pumping well from which ground water is being abstracted. If, more than one pumping wells are constructed tapping aquifers at different depths, more than one piezometers shall be required to be constructed tapping different aquifers as in the pumping wells.

- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tubewells has been stopped for about four to six hours.

- The ground water quality has to be monitored once in a year during pre-monsoon (April/ May) period by industries and mines drawing ground water. Samples of ground water should be analyzed from NABL accredited laboratory.

- A permanent display board should be installed at Piezometer/ Tubewell site for providing the location, piezometer/ tubewell number, depth and zone tapped of piezometer/tubewell for standard referencing and identification.

- Any other site specific requirement regarding safety and access for measurement may be taken care off.

Annexure III

Measures to be adopted to ensure prevention from pollution in the plant premises of polluting industries/ projects

It has been observed that ground water in and around polluting industries like Tannery, Slaughter Houses, Dye, Chemical, Coalwashery, other hazardous units, etc., is polluted. In order to prevent further deterioration of ground water quality, it is essential to take all necessary measures for well head protection. All industries/ projects falling under this category are hereby directed to follow the under mentioned procedure both for existing and new category.

1. No tube well/ bore well / dug well should be constructed in the vicinity of the processing unit. Tube well/ bore well should be constructed at the place which is hygienically maintained.

2. Only Mild Steel pipe should be used for assembly/ casing and PVC (Poly Vinyl Chloride) or similar pipes should not be used. The tube well/ bore well having PVC or similar pipes should be abandoned and filled back.

3. Around the tube well/ bore well, RCC (Reinforced Concrete Cement) grouting of 3 meters (length) x 3 meters (width) x 2 meters (depth) must be provided. The pipe of the tube well/ bore well must be raised 1 meter above ground level (1 magl). The tube well/ bore well must be surrounded by RCC wall of 0.5 meter height and 1.5 meter depth to prevent any surface contamination to enter the constructed tube well/ bore well. Plan/Sectional diagram is enclosed for reference (Appendix 1 and 2).

3. The tube well/ bore well must be fitted with NRV (Non Return Valve) in order to ensure that the constructed tube well/ bore well is exclusively used for abstraction of ground water only.

4. At no point of time there should be any injection of any water or fluid into the constructed tube well/ bore well/ Piezometer.

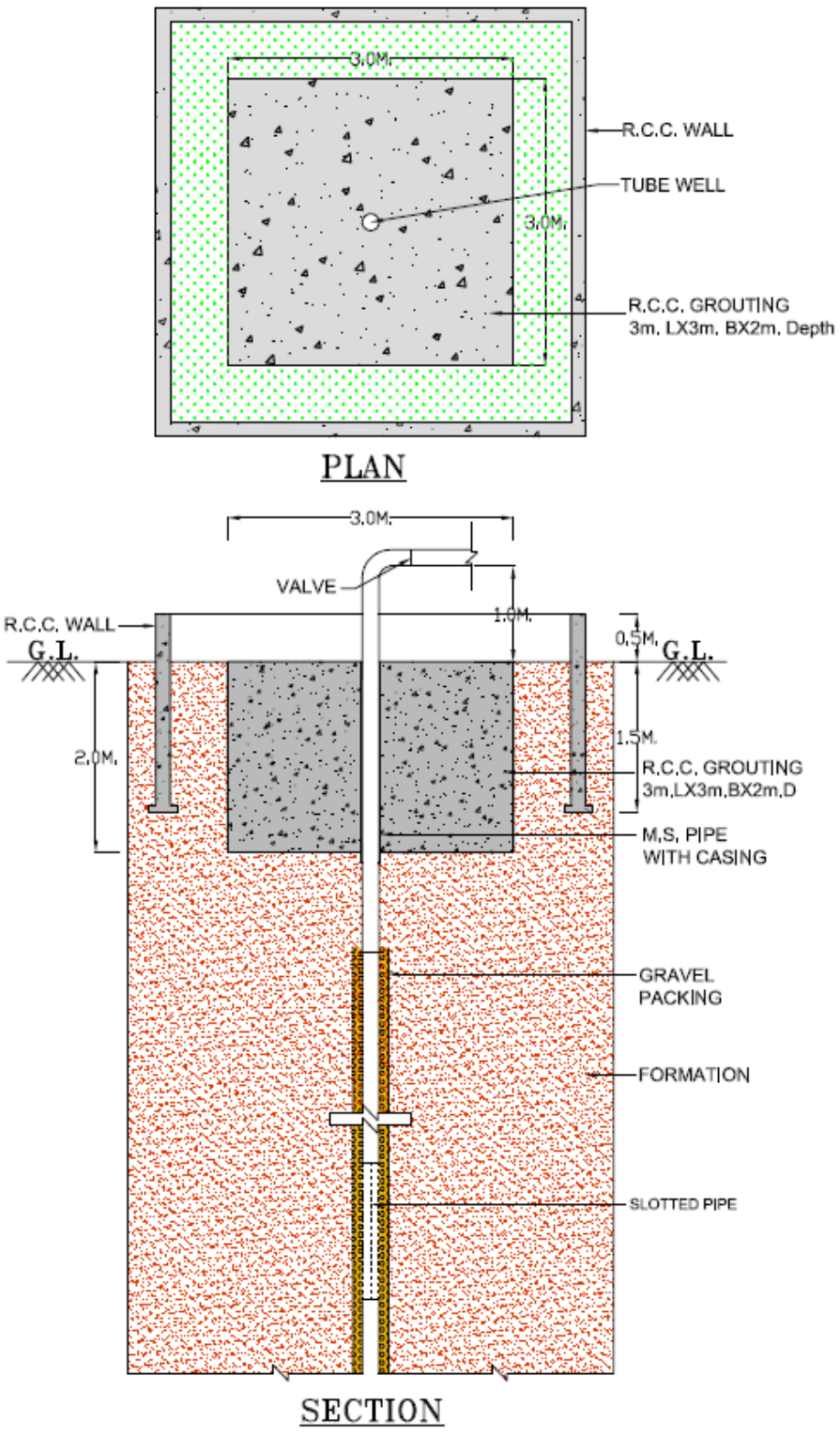
5. The industries/ projects under this category should not implement any recharge measures within the plant premises.

6. Any tube well/ bore well located/ constructed in the vicinity of STP (Sewage Treatment Plant) or ETP (Effluent Treatment Plant) should be abandoned and filled back.

7. The piezometer to be constructed for monitoring purpose should follow the same procedure as that for tube well/ bore well for such industries/ projects.

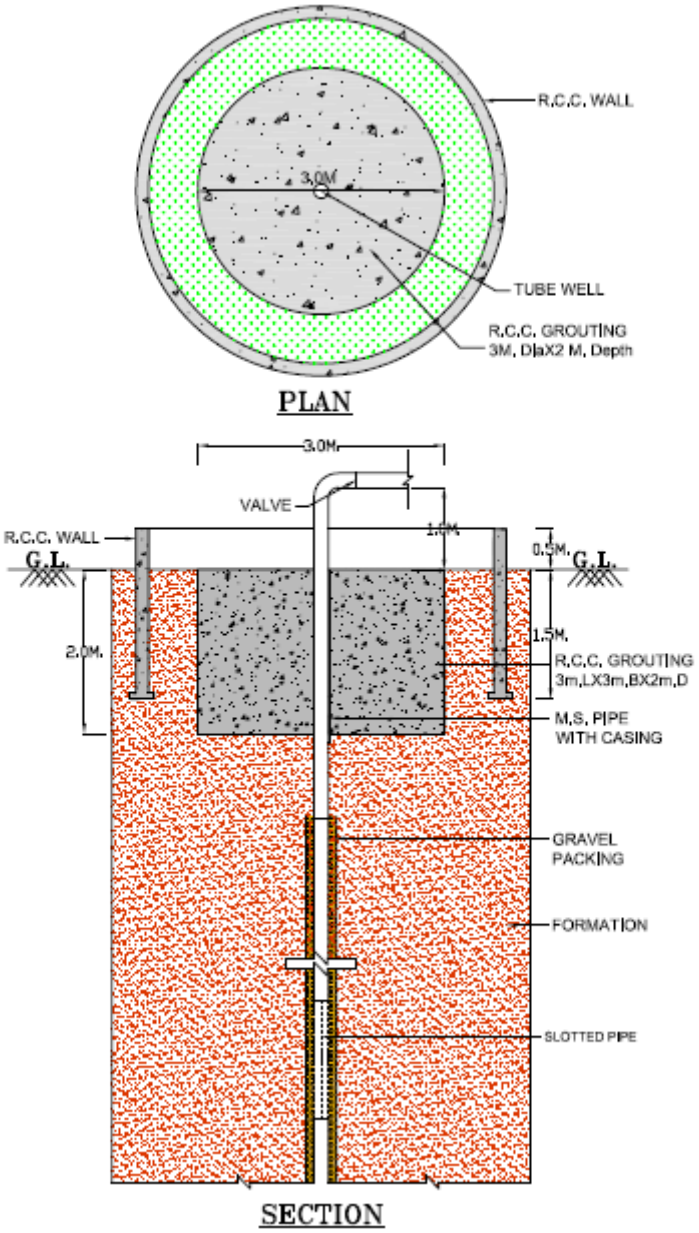
Appendix 1

Plan/ Sectional diagram showing well head protection



Appendix 2

Plan/ Sectional diagram showing well head protection



Annexure-IV

Outline of hydro-geological Report for obtaining No Objection Certificate for industries

1. Brief about the proposed project giving location details, coordinates, google/ toposheet maps, etc. demarcating the project area.

2. Ground water situation in and around the project area including water level and quality data and maps along with quality issues, if any. In case of mines, ground water conditions in both core and buffer zone should be described.

3. Details of the tubewells/ borewells proposed to be constructed. This includes the drilling depth, diameter, tentative lithological log, details of pump to be lowered, H.P. of pump, tentative discharge of tubewells/ borewells, etc. Locations to be marked on the site plan/ map. Location of proposed piezometers.

4. Details of Geophysical studies carried out in and around the project area. Ground water resources computation of the block in which the project falls.

5. Approved Mine plan in case of mines and detailed dewatering plan in case of mine/ infrastructure dewatering projects.

6. Proposed usage of pumped water in case of mining/ infrastructure dewatering projects.

7. Comprehensive assessment of the impact on the ground water regime in and around the project area highlighting the risks and proposed management strategies proposed to overcome any significant environmental issues.

8. Proposed measures for disposal of waste water by industries drawing saline water.

9. Measures to be adopted for water conservation which include recycling, reuse, treatment, etc. This includes the water balance chart being adopted by the firm along with details of water conservation methods to be adopted.

- Brief write up along with capacity and flow chart of Sewage Treatment Plants / Effluent Treatment Plants / Combined Effluent Treatment Plants existing/ proposed within the project.
- Details of water conservation measures to be adopted to reduce/ save the ground water.
- Total water balance chart showing the usage of water for various processes.

10. Any other details pertaining to the project.

Annexure V

Format of the Report on ground water conditions (for mining projects)

Introduction

Project description

Background

Objectives and scope

Regional setting

Location

Landuse

Climate

Topography and drainage

Geology –Regional and Local

General Hydrogeology (aquifer types, aquifer depth, zone tapped etc.)

Groundwater condition (In core and buffer zones)

Spatial and temporal variations in water levels Groundwater quality (Shallow and deep aquifer)

Impact of groundwater extraction on local groundwater

Hydrograph of water level/piezometer in monitoring wells

Trend analysis of historical water levels Flow net analysis (groundwater flow direction)

Year wise/ bench wise mine dewatering computation as per approved mine plan

Conclusions

Annexure VI

Indicative list of Infrastructure projects

Residential townships including commercial buildings
Office building
School
College
University
Special Economic Zone
Metro Station
Railway Station
Bus Depot
Airport
Seaport
Highway infrastructure
Fire station
Warehouse
Business Plaza
Malls & Multiplex
Hospitals
Nursing Homes
Resort
Hotel/ Restaurant/ Food Plaza
Holiday home/Guest house/ Hostels
Banquet Hall/ Marriage Gardens
IT Complex
Logistics & Cargo
Clubs
Trade Centre

Annexure -VII

Supreme Court Order in Civil Writ petition 36 of 2009 regarding measures for prevention of fatal accidents of small children due to their falling into abandoned bore wells and tube wells

In Re: Measures for prevention of fatal accidents of small children due to their falling into abandoned bore wells and tube wells

Union of India and Ors. Respondents(s)

ORDER

With this Court issuing requisite guidelines vide order dated 11th February, 2010, subject to slight modifications, nothing survives in the present writ petition.

That modification is as follows:

(i) The owner of the land/ premises, before taking any steps for constructing bore well/ tube well must inform in writing to the concerned authorities in the area, i.e., District Collector/ District Magistrate/ Sarpanch of the Gram Panchayat/ any other Statutory Authority/ concerned officers of the Department of Ground Water/ Public Health/ Municipal Corporation, as the case may be, about the construction of bore well/ tube well.

(ii) Registration of all the drilling agencies, namely, Government/ Semi Government, Private etc. should be mandatory with the district administration/ Statutory Authority wherever applicable.

(iii) Erection of signboard at the time of construction near the well with the following details:-

(a) Complete address of the drilling agency at the time of construction/ rehabilitation of well.

(b) Complete address of the user agency/owner of the well.

(iv) Erection of barbed wire fencing or any other suitable barrier around the well during construction.

(v) Construction of cement/ concrete platform measuring 0.50x0.50x0.60 meter (0.30 meter above ground level and 0.30 meter below ground level) around the well casing.

(vi) Capping of well assembly by welding steel plate or by providing a strong cap to be fixed to the casing pipe with bolts & nuts.

(vii) In case of pump repair, the tube well should not be left uncovered.

(viii) Filling of mud pits and channels after completion of works.

(ix) Filling up abandoned bore wells by clay/sand/boulders/pebbles/drill cuttings etc. from bottom to ground level.

(x) On completion of the drilling operations at a particular location, the ground conditions are to be restored as before the start of drilling.

(xi) District Collector should be empowered to verify that the above guidelines are being followed and proper monitoring check about the status of bore holes/ tube wells are being taken care through the concerned state/ Central Government agencies.

(xii) District/ Block/ Village wise status of bore wells/tube wells drilled viz. No. of wells in use, No. of abandoned bore wells/ tube wells found open, No. of abandoned bore wells/ tube wells properly filled up to ground level and balance number of abandoned bore wells/ tube wells to be filled up to ground level is to be maintained at District Level.

In rural areas, the monitoring of the above is to be done through Village Sarpanch and the Executive from the Agriculture Department.

In case of urban areas, the monitoring of the above is to be done through Junior Engineer and the Executive from the concerned Department of Ground Water/Public Health/ Municipal Corporation etc.

(xiii) If a bore well/ tube well is 'Abandoned' at any stage, a certificate from the concerned department of Ground Water/ Public Health/ Municipal Corporation/ Private Contractor etc. must be obtained by the aforesaid agencies that the 'Abandoned' bore well/tube well is properly filled upto the ground level. Random inspection of the abandoned wells is also to be done by the Executive of the concerned agency/ department. Information on all such data on the above are to b maintained in the District Collector/ Block Development Office of the State.

We are informed that the last paragraph of the earlier order dated 11th February, 2010, concerning publicity has been duly complied with.

Subject to the above, the writ petition is disposed of.

……..CJI.
[S.H. KAPADIA]

……..….J.
[K.S. RADHAKRISHNANA]

……..…….J.
[SWATANTER KUMAR]

New Delhi,
August 6, 2010

ANNEXURE VIII

List of States/Union territories where ground water extraction is being regulated by Central Ground Water Authority

1. Andaman and Nicobar Islands
2. Assam
3. Arunachal Pradesh
4. Bihar
5. Chhattisgarh
6. Dadra and Nagar Haveli and Daman and Diu
7. Gujarat
8. Haryana
9. Jharkhand
10. Madhya Pradesh
11. Maharashtra
12. Manipur
13. Meghalaya
14. Mizoram
15. Nagaland
16. Odisha
17. Punjab
18. Rajasthan
19. Sikkim
20. Tripura
21. Uttar Pradesh
22. Uttarakhand
23. Andhra Pradesh (only mining projects)
24. Telangana (only mining projects)

Annexure IX

Glossary of technical terms used

1. **Safe area**: Area categorized as SAFE from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organizations. Details available on the websites of NOCAP and CGWB.
2. **Semi-critical area**: Area categorized as SEMI-CRITICAL from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organizations. Details available on the websites of NOCAP and CGWB.
3. **Critical area**: Area categorized as CRITICAL from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organisations. Details available on the websites of NOCAP and CGWB.
4. **Over-exploited area**: Area categorized as OVER-EXPLOITED from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organisations. Details available on the websites of NOCAP and CGWB.
5. **Aquifer**: Geological formation capable of storing and transmitting ground water.
6. **Deeper Aquifer**: In areas having multiple aquifer system, the aquifer(s) occurring below the uppermost aquifer.
7. **Well**: Any structure used for the extraction of groundwater, including open wells, dug wells, bore wells, dug-cum-bore wells, tube wells, filter points, collector wells, infiltration galleries, recharge wells, or any of their combinations or variations.
8. **Government Agency**: May be Central or State Government body.
9. **Supplier**: Government/ Government approved Water Supply Agency.
10. **Mine**: Area where mining activity is taking place, or area abandoned after mining.
11. **Illegal Ground Water abstraction Structure**: Any energized abstraction structure viz. dugwell, tubewell, borewell which is being used to withdraw ground water without valid No Objection Certificate from Central Ground Water Authority.
12. **Rainwater Harvesting**: The technique or system of collection and storage of rainwater, at micro watershed scale, including roof-top harvesting, for future use or for recharge of groundwater.
13. **Mining Project**: Project which involves mining activity either open cast or underground or both.
14. **Ground Water Draft**: Quantum of ground water withdrawal.
15. **Saline Water**: Water having salinity in excess of 2500 µsiemens/cm at 25^0C.
16. **Water Table Intersection**: Intersection of the water table on excavation of the overlying material due to mining or other activities.
17. **Drinking and domestic use**: Besides drinking & domestic use of households, this category will cover drinking requirement of industries not requiring water for industrial process; drinking, washing, cleaning use etc. in case of hospitals, hotels, malls & multiplexes, institutions, offices, banquet halls, fire stations, metro stations, railway stations, airports, sea ports, stadia etc.
18. **Recycle/Reuse**: Using treated waste water for various purposes/ putting water to multiple uses.
19. **Government Department:** Either Central Government or State Government.
20. **Municipality:** Municipality, a Municipal Corporation or similar body of local urban governance by any other name.
21. **Groundwater:** Water, which exists below the surface in the zone of saturation and can be extracted through wells or any other means or emerges as springs and base flows in streams and rivers;
22. **Bgl :** Below Ground Level.
23. **BCM :** Billion cubic metres.

24. **Groundwater Abstraction structure:** Structure used to withdraw groundwater like bore well / tube well / dug well/dug cum bore well/tunnel well.

25. **Observation well or Piezometer:** A bore well/tube well used only for measuring the water level/piezometric head and to take water sample periodically but not used for groundwater abstraction.

26. **Water Audit:** A method of quantifying water use in simple or complex systems, with a view to reducing water usage and often saving money on otherwise unnecessary water use.

27. **Ground water pollution:** If concentration of any parameter in ground water exceeds the maximum permissible limit for drinking water prescribed by the Bureau of Indian Standards.

28. **Cooperative Group Housing Societies/ Builder flats**: A Housing Society is a society formed by house owners within a residential complex. The housing society formed must be formally registered with registrar of co-operatives.

29. **KLD –** Kilo Litre per day

30. $\mathbf{EC_{GW}}$ - Environmental compensation for drawing illegal ground water.

31. $\mathbf{EC_{GWR}}$ - Environmental compensation rates for drawing illegal ground water.

ANNEXURE X

Annual water audits by the industries (Source – CII)

Water audit is a systematic process of objectively obtaining a water balance by measuring flow of water from the site of water withdrawal or treatment, through the distribution system, and into areas where it is used and finally discharged. Conducting a water audit involves calculating water balance, water use and identifying ways for saving water.

Water audit involves preliminary water survey and detailed water audit. Preliminary water survey is conducted to collect background information regarding plant activities, water consumption and water discharge pattern and water billing, rates and water cess. After the analysis of the secondary data collected from the industry, detailed water audit is conducted, which involves the following steps:

- On site training and discussion with facility manager and personnel
- Water system analysis
- Quantification of baseline water map
- Monitoring and measurements using pressure and flow meters and various other devices
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use

A detailed water balance is finally developed. Water quality requirement at various user areas is mapped, which helps in developing ‘recycle’ and ‘reuse’ opportunities.

The detailed water audit report contains the following:

- Water consumption and wastewater generation pattern
- Specific water use and conservation
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Full description and figures
- Investment required

Industries can undertake following measures for water conservation:

- Setting up of norms for water budgeting
- Modernization of industrial process to reduce water consumption
- Recycling water with a re-circulating cooling system
- Ozonation cooling water approach which can result in five fold reduction in blow down when compared to traditional chemical treatment
- Reduction in reuse of de-ionized water by eliminating some plenum flushes, converting from a continuous flow to an intermittent flow system and improving control on the use
- Use of waste water for gardening
- Proper processing of effluents to adhere to the norms of disposal.

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All Mines.

Sub: Damage of structures due to blast induced ground vibrations in the mining areas.

1.Introduction :

In response to increase demand for coal and other minerals, a number of large mechanised opencast mines have come into operation. Some of these opencast workings are located near surface structure like residential buildings , schools, commercial shops. Hutments with large number of inhabitants etc. Whenever blasting is done in these opencast mines, ground vibrations are generated outward from the blast area and cause damage to surrounding surface structures. The vibrations radiating from the blast holes while passing through surface structures, induce vibrations on the structures causing resonance. The components of ground motion can affect the structures through compression and tension and also through vertical and horizontal shearing effects. Blast induced ground vibrations create socioeconomic problems for the mine managements as well as the people residing in vicinity of these mines. As only 20-30 % of energy of commercial explosives used in the mines is utilized for fragmenting the rock, the rest of energy is transmitted through the earth in the form of ground vibrations resulting in damage to the surrounding structures.

2.0 Damager Criteria

The peak particle velocity has so far been considered as the best criteria for evaluating blast vibrations in terms of its potential to cause damage. The extensive studies on the problems have established that the frequency of the waves is also equally important factor to consider the effect of damage.

The blasting damage is generally classified into following four categories :

Sl. No.	Category	Description of damage
(i)	No appreciable damage.	No formation of noticeable cracks.
(ii)	Threshold damage	Formation of fine cracks, fall of plaster, opening & lengthening of old cracks, loosening of joints, dislodging of loose objects etc.
(iii)	Minor damage	Superficial not affecting the strength of structure(s). Hair line cracks in masonry around openings near partition, broken windows. Fall of loose mortar etc.
(iv)	Major damage	Formation of several large cracks, serious weakening of structures, shifting of foundation, fall of masonry, ruptures of opening vaults etc.

3.0 Natural Frequencies

Elements of building construction such as sprung floors, stud partition walls, ceiling and windows can all react as mass-spring systems, each with its own natural frequencies of about 4-24 Hz (low frequencies) Ground vibrations at these frequencies amplified by the structures increase the risk of damage. When the low frequency ground vibration coincides with the natural frequency of the structure resonance in originated. The resonance is a state in which the structure absorbs most energy progressively becoming deformed with time, until plastic deformation occurs. Therefore even the low peak particle velocity of ground vibrations at natural frequency of structure is more harmful to the structure. Natural frequencies of brick and concrete structure generally vary from 8-16 Hz.

4.0 Structural response

All structures develop cracks from natural causes like periodic changes in humidity, temperature and wind velocity. Changes in soil moisture cause foundation cracks. The width of old cracks change seasonally and number of cracks increase with the time. This damage is independent of damage caused by blasting.

The cracking location and the wall material have an influence on the particle velocity at which cracking begins. If the entire structure is not inspected thoroughly, there may be chances of biased opinion on the type of cracks. Thus it is important to place transducer properly for the correct assessment of damage.

In the mud houses, number of cracks develop before blasting and these cracks widened and et extended with the passage of time. These cracks are further widened and get extended due to blast induced ground vibrations. Concrete structures vibrate for longer duration that brick and mud structures. Concrete walls have free top and show no cracks at vibration levels for which mud and brick walls can damage Cracks develop in concrete walls with large vibration level. Cracks in brick- structures can be observed in junction of walls, roof and at window corners. Brick walls with clay mortar and cement- sand mortar behave in same fashion. Steel structures can sustain more vibration level.

The magnitude of vibration on structures in much more than on the ground. Duration of vibration in structure is also longer than, that of ground vibration. Multi-storied buildings are more sensitive to blast vibration that the single-storied buildings.

To predict the extent of damage and to take preventive measures, it is necessary to measure ground vibrations due to blasting. Studies on structural response of ground vibration in the structures of different constructions within the mining areas under Indian condition are limited and therefore such study should be carried out to ascertain the degree of damages for improvement and standardization of damage criteria under Indian conditions.

5.0 Measurement of blast induced vibrations

5.1 Instrumentation

The instrument selected for monitoring blast induced ground vibration shall be simple, light, compact, easily portable, battery operated, digital form output, triggering by geophone etc. Triaxial transducers for recording blast vibration shall have a liner frequency upto 500 Hz and capable of recording particle velocity upto 100 mm/s.

5.2 Methodology

The transducers shall be placed near the structure on the solid undisturbed ground and should be placed well in contact with the ground. For structural response, the transducers shall be placed horizontally over the wall, floors and ceiling. A minimum of 15 points of observations corresponding to a minimum of 10 blasts shall be made for better prediction with a high index of determination.

5.3 Predictor Equation

The least means square method of regression analysis shall be used to interpret the date. The square roof scale distance shall be used for analysis and interpretation of data when blasting is done on surface and measurements are taken on the surface, or the blasting is done underground and measurements are taken underground. On the other hand, if blasting is done on the surface and the measurements taken underground the cube root scaled distance shall be used.

6.0 Guidelines on experimental blasting

6.1 Factors

Major factors affecting particle velocity of ground vibration are type and amount of explosive charge used, distance from the charge to the point of observation (surface structures), geological, structural and physical properties of the rock that transmits the vibrations, height of structures and blast geometry. Use of safe charge/delay, in hole delay with non- electric initiation systems. Proper burden, inclined holes in conformity with slope of bench, deck charge, air deck, sequential blasting, clearing off loose pieces of rocks from the blast site and proper stemming of holes bring reduction in blast induced ground vibrations. Controlled blasting methods in conjunction with effective muffling of holes will control ground vibrations and also arrest fly rock.

6.2 Plan

A plan showing structures belonging to the to the owner and not belonging to the owner in different prominent shades should be prepared. The plan shall incorporate details of construction of the structures in a tabular form. Plan should also show 50 m., 100m, 200 m and 300 m zones from the structures, the place of experimental study and the limit upto the which blasting is proposed to continue.

6.3 Study/ observations

In a particular mining area with built-up structures where deep hole blasting is to be introduced for the first time, experimental blasting shall be carried out by any research/ academic institute much before the structures fall within the blasting danger zone. The type of instruments, the methodology and predictor norm as recommended in para 5.0 shall be followed in measurement of blast induced vibrations. Based on the study, the safe charges for different zones shall be determined and recommendations made in the report. In a cluster of buildings of different types existing close to each other, the charge for the buildings/ structures requiring greater protection against damage shall be assessed and recommended.

6.4 Structural response

During the study the response of the structures assuming different natural frequencies should be calculated and plotted on a figure. Softwares with the different programmes are available now for the said plot and should be used for convenience.

6.5 Monitoring

In order to ensure effective control over the vibration and related damages there is a need for regular in-house monitoring and the managements should train the blasting personnel during the experimental study and start observations on their own during the regular blasting operations.

7.0 Recommended permissible standards of blast induced ground vibrations:

7.1 Technical considerations

Permissible standards for different type of structures have been arrived at considering the importance of building and structures. The buildings of historical importance and multi- storied structures are likely to get damaged with low level of vibration and therefore permissible standards are to be lowest. Similarly buildings not belonging to the owner but with mud/brick in cement construction and others with good construction (RCC and framed structures) should also be protected but higher permissible standards than that of the level fixed for first category has been allowed.

The buildings belonging to the owner of the mine are constructed for a limited period generally equal to the life of the project. The management accept that these buildings constructed within the mining area are likely to suffer some damages during the extraction of minerals, but the damages should be repairable. Therefore, slightly higher permissible levels of vibrations have been allowed in such cases.

7.2 Permissible standards

Depending on the type of structures and the dominant excitation, the peak particle velocity (ppv) on the ground adjacent to the structure shall not exceed the values given below in the table.

Table: Permissible Peak Particle Velocity (ppv) at the foundation level of structures in Mining Areas in mm/s

Type of structure	Dominant excitation Frequency, Hz		
	<8 Hz	8-25 Hz	>25 Hz
(A) Buildings/structures not belong to the owner			
(i) Domestic houses/structures (kuchha brick & cement)	5	10	15
(ii) Industrial Buildings (RCC & Framed structures)	10	20	25
(iii)Objects of historical importance & sensitive structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
(i) Domestic houses/structures (kuchha, brick & cement)	10	15	25
(ii) Industrial buildings (RCC & framed structures)	15	25	50

In view of the complexities of the problems I hope you all would take adequate measures as recommended above to ensure that the blasts near surface structures are carried out with utmost care and precautions. The blast induced ground vibration should be within the permissible limits as specified above.

DGMS (Tech) (S&T) Circular No.8 of 1997 Dhanbad, dated the 12th Nov,1997.

All Mines.

Sub: Suppression of Mine Dust by using 'Pulver Bond' and 'Dust Bond "

1.0 Introduction :

Most Mining operations produce dust which, when air borne, becomes a serious hazard to the health of workers and the equipment/ machines. Besides coal dust which is inflammable may also lead to disastrous explosion. In recent times with introduction of mechanisation both in opencast and underground mines, it has become a bigger danger then ever before since operations of machines usually throw up much more dust as compared to hand operations. Dust of any kind of sufficiently fine quality when inhaled in large quantities may lead to development of respiratory diseases such as Pneumoconiosis and Silicosis etc. Sizeable amounts of dusts are also produced and are rendered air borne in and around haul roads in open cast mines during material transportation by dumpers etc.

Fine dust rendered air borne remain in the atmosphere for a considerable length of time thereby positively polluting the environment . The best method of preventing roadways dust getting air borne is to consolidate it by wetting the dust with water sprays, but water sprays alone do not produce good wetting of all deposited dust and a large quantities of water may be needed frequently for producing effective results due to propensity of water to evaporate in hot and dry conditions. Wetting Agent, if added would increase the ability of water to consolidate & hold together the smaller dust particles and this Directorate vide Cir. No. 31 of 1966, Cir No.62 of 1966 and Cir No.40 of 1967 had advised the industry to use Wetting Agents for effective suppression of dust. These wetting agents were either syrupy liquid or non-ionic detergents and did not form ionized emulsion and thus not very effective for consolidation of loose dust in order to ultimately prevent it from air borne.

Blast vibration data (Monitoring at UG)							
S.no	**Date**	**Blast location (stope)**	**Monitoring location**	**Radial distance (m)**	**MCPD (kg)**	**PPV (mm/s)**	**Frequency (Hz)**
1	02-Mar-21	-305L_S262	-205L_S 426	209	72	3	141
2	07-Mar-21	-255L_S532	-205L_S426	129	138	3.7	112
3	16-Mar-21	-280L_S592	-205L_S 426	139	90	3.2	123
4	22-Mar-21	-180L_S202	-205L_S426	149	84	3.9	115
5	28-Mar-21	-205L_S300	-205L_S 426	350	78	2.4	155
6	11-Feb-21	-305L_N397B	-230L_N MP	170	114	1.92	118
7	15-Feb-21	-255L_S300A	-230L_N MP	150	135	2.49	101
8	19-Feb-21	-305L_N52	-230L_N MP	110	150	3.41	113
9	21-Feb-21	-255L_S607	-205L S426	120	95	3.01	128
10	23-Feb-21	-280L_S360	-205L_S426	185	105	1.85	135
11	02-Jan-21	-255 S 577	-205L_S426	80	80	3.3	112
12	08-Jan-21	-305 N 397 A	-230L_N MP	120	145	2.1	121
13	13-Jan-21	-305 S 247 A	-205L_S426	150	125	1.8	113
14	20-Jan-21	-280 S 330 A	-205L_S426	110	85	2.5	105
15	27-Jan-21	-280 S 187	-205L_S426	180	77	1.2	128
16	5-Dec-20	-255L_S517	-205L_S 426	117	66	3.2	75.3
17	7-Dec-20	-255L_N547A	-230L_N MP	347	102	3.7	80.0
18	8-Dec-20	-280L_N442A	-230L_N MP	257	144	2.8	82.0
19	8-Dec-20	-280L_S270	-205L_S 426	186	186	3.4	75.8
20	11-Dec-20	-255L_S517	-205L_S 426	117	78	3.1	78.6
21	13-Dec-20	-280L_S472	-205L_S 426	119	66	3.1	85.1
22	24-Dec-20	-280L_N67	-230L_N MP	166	96	3.5	88.0
23	4-Nov-20	-255L_S285	-205L_S 426	144	90	2.8	78.8
24	6-Nov-20	-255L_S547 & S562	-205L_S 426	143	54	2.4	85.0
25	13-Nov-20	-280L_N52	-230L N MP	165	90	3.3	84.2
26	22-Nov-20	-255L_S592	-205L_S426	172	66	3.7	180.0
27	22-Nov-20	-80L_N442	230L N MP	314	168	3.1	75.0
28	23-Nov-20	-255L_N547 A	-230L_ N MP	338	120	1.8	85.1
29	28-Nov-20	-255L_S592	-205L_ S426	172	54	1.7	120.0
30	2-Oct-20	-205L_S345	-205L_S 426	80	102	3.8	177
31	3-Oct-20	-155L_N23	-230L_N MP	204	54	1.5	89.7
32	4-Oct-20	-205L_S112	-205L S 426	310	180	2.6	121
33	8-Oct-20	-155L_N23	-230L N MP	204	96	3.3	80
34	12-Oct-20	-280L_N285	-230L N MP	128	144	2.8	83.2
35	14-Oct-20	-205L_S270	-205L_S426	156	72	2.5	86
36	23-Oct-20	-305L_N337	-230L_N MP	183	144	3.5	77.7

Peak particle velocity

HINDUSTAN ZINC LIMITED
RAMPURA AGUCHA MINE

AIR MONITORING : AMBIENT AIR & STACK: Oct-16 to March -17

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-16	Ist	301.08	81.13	33.22	8.40	16.10	398.00	306.79	77.08	29.04	7.40	15.40	420.00	314.61	81.63	33.00	9.40	17.40	402.00
	IInd	307.11	80.97	33.13	9.40	15.10	435.00	299.42	76.79	29.02	8.10	13.10	465.00	312.10	83.67	37.11	10.10	15.40	467.00
Nov-16	Ist	296.09	78.64	37.31	9.00	14.20	510.00	282.43	73.56	28.67	7.80	14.40	470.00	304.88	79.63	36.86	8.40	15.20	565.00
	IInd	295.37	79.43	33.20	7.50	18.10	495.00	301.20	75.57	32.68	6.40	12.40	440.00	304.42	84.40	37.11	5.40	14.40	426.00
Dec-16	Ist	297.67	73.56	32.67	8.10	15.20	563.00	290.52	69.78	29.00	9.40	16.00	520.00	303.58	75.84	37.25	7.80	16.20	540.00
	IInd	307.83	79.79	29.15	8.80	14.50	460.00	309.94	73.39	28.76	8.40	15.00	440.00	305.76	78.66	32.77	6.20	15.00	390.00
Jan-17	Ist	297.45	78.64	33.32	9.40	14.20	570.00	277.57	69.65	24.67	8.60	14.40	506.00	297.88	77.46	32.70	10.40	15.20	540.00
	IInd	284.82	81.52	30.75	9.85	14.67	470.00	258.46	79.53	35.05	7.27	15.56	360.00	246.95	77.36	37.69	9.05	12.73	430.00
Feb-17	Ist	312.77	77.67	29.02	7.80	13.50	512.00	288.33	69.44	28.78	8.40	14.51	380.00	322.30	79.44	32.92	7.45	15.61	430.00
	IInd	323.13	78.01	33.05	8.15	15.16	450.00	234.72	72.48	30.45	7.20	13.57	480.00	291.55	80.92	36.89	7.20	14.57	380.00
Mar-17	Ist	297.95	74.14	37.28	8.90	15.20	490.00	291.05	71.49	29.02	9.20	14.90	510.00	319.17	77.20	33.19	7.45	15.61	480.00
	IInd	280.27	82.03	43.66	9.26	17.38	460.00	299.18	79.15	30.81	8.44	16.77	470.00	342.80	88.04	43.52	9.67	17.31	430.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-16	Ist	220.35	59.09	24.57	6.40	10.50	310.00	174.35	53.35	24.92	6.50	11.20	250.00	227.03	52.48	20.77	6.40	13.20	260.00
	IInd	218.58	60.75	28.67	7.20	9.00	368.00	178.02	55.02	25.57	7.40	9.70	326.00	227.53	54.53	24.89	8.00	11.20	330.00
Nov-16	Ist	210.02	59.60	29.04	6.70	9.40	350.00	181.82	53.55	24.67	6.10	10.40	320.00	216.36	53.53	24.66	7.00	14.10	290.00
	IInd	203.23	57.46	24.58	6.10	10.10	325.00	189.81	58.14	24.63	7.30	11.50	374.00	238.02	55.28	24.64	7.60	13.20	356.00
Dec-16	Ist	209.20	59.70	24.66	6.40	10.50	392.00	191.01	55.42	24.99	7.20	10.00	368.00	230.70	55.15	24.76	6.40	13.40	329.00
	IInd	198.56	60.95	20.54	5.60	11.30	340.00	185.76	53.29	24.51	6.40	12.40	380.00	199.69	53.65	20.45	5.40	11.40	341.00
Jan-17	Ist	199.81	61.47	24.87	6.20	9.60	390.00	193.08	57.80	20.70	6.50	8.80	390.00	215.28	56.57	20.62	6.90	12.00	260.00
	IInd	178.52	60.61	27.51	4.18	10.42	210.00	160.93	57.19	18.07	5.08	11.27	240.00	162.41	51.13	21.45	5.06	9.87	190.00
Feb-17	Ist	209.43	68.14	24.78	6.01	10.15	316.00	193.10	57.24	24.78	6.40	9.82	280.00	223.65	56.85	20.73	6.10	11.25	275.00
	IInd	213.63	71.39	23.96	5.88	12.06	240.00	173.92	62.98	25.35	5.88	10.10	190.00	162.26	47.15	24.19	5.89	10.78	160.00
Mar-17	Ist	217.40	68.23	24.87	6.60	10.50	316.00	197.32	56.16	20.83	6.90	10.20	246.00	192.72	59.59	24.88	6.11	12.40	246.00
	IInd	228.96	73.82	28.06	5.94	11.51	240.00	185.77	62.17	25.10	5.41	11.61	190.00	178.71	53.21	26.49	5.17	11.22	220.00

STACK MONITORING SPM

Month-Yr	Forthnight	Pr Crusher	S. Crusher	New crusher
Oct-16	Ist	23.16	27.43	22.14
	IInd	24.04	31.63	22.36
Nov-16	Ist	27.78	30.53	26.19
	IInd	35.14	37.04	29.14
Dec-16	Ist	25.66	29.67	26.72
	IInd	21.43	34.00	25.33
Jan-17	Ist	31.03	33.41	28.57
	IInd	33.36	22.36	17.15
Feb-17	Ist	13.57	16.83	27.08
	IInd	24.04	24.04	25.79
Mar-17	Ist	21.99	25.40	23.81
	IInd	20.71	18.79	21.48

All figures are in (mg/m3)

Walid
Env

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK: Apr-2017 to Sep-2017

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-17	Ist	306.62	82.87	36.85	8.00	14.40	470.00	304.67	76.32	33.03	8.10	15.00	560.00	306.23	80.97	33.17	6.90	13.41	460.00
	IInd	289.63	85.52	34.01	7.75	17.19	430.00	328.30	81.28	35.70	7.07	18.71	490.00	301.20	78.16	32.72	7.37	15.05	380.00
May-17	Ist	307.94	87.28	32.78	7.70	13.40	390.00	320.46	83.67	37.28	8.90	14.00	440.00	319.44	84.85	37.31	7.10	13.40	420.00
	IInd	308.31	81.67	36.99	8.80	17.67	410.00	314.56	85.58	34.82	8.70	15.63	380.00	362.16	83.77	37.97	8.11	15.51	450.00
Jun-17	Ist	296.36	77.68	28.97	8.10	12.00	480.00	290.99	75.85	28.66	9.20	13.00	540.00	299.77	79.11	29.02	7.90	12.40	510.00
	IInd	184.95	47.51	24.36	5.12	7.34	450.00	270.30	52.74	23.19	6.19	18.69	450.00	212.78	36.79	16.79	3.36	9.37	390.00
Jul-17	Ist	278.98	69.78	24.78	9.40	10.40	490.00	272.10	68.16	24.55	5.40	12.00	535.00	273.60	70.39	24.89	7.50	10.20	390.00
	IInd	183.26	54.07	23.77	5.75	12.10	320.00	190.20	67.55	24.03	4.92	10.81	270.00	190.37	66.81	26.21	5.57	14.77	350.00
Aug-17	Ist	312.77	72.12	24.10	7.60	16.49	452.00	207.00	69.44	22.44	11.10	14.10	340.00	322.30	77.95	27.14	7.45	22.15	400.00
	IInd	307.60	74.40	26.64	6.89	22.16	390.00	243.89	72.39	27.34	7.05	16.02	320.00	344.51	80.42	35.36	7.71	18.75	340.00
Sep-17	Ist	296.67	75.59	33.31	6.90	12.10	511.00	298.00	76.25	28.98	8.20	10.10	428.00	310.95	80.97	33.19	8.01	14.31	460.00
	IInd	316.10	78.57	36.41	8.22	15.16	440.00	274.12	87.19	37.46	9.25	17.66	499.00	329.75	75.61	37.94	8.04	14.16	420.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-17	Ist	224.29	69.78	28.91	6.90	11.10	270.00	206.48	61.11	24.87	6.40	11.40	310.00	198.78	64.37	24.55	5.20	10.60	280.00
	IInd	213.62	71.22	26.51	6.20	9.96	190.00	187.82	60.03	24.83	6.33	10.88	230.00	170.97	56.09	25.42	4.73	9.83	210.00
May-17	Ist	229.90	73.58	24.84	7.10	7.10	310.00	201.92	60.70	28.77	6.90	10.40	280.00	206.65	61.42	28.97	5.50	9.40	320.00
	IInd	222.25	65.67	21.51	6.11	14.53	240.00	196.56	60.73	24.92	6.50	9.90	210.00	215.30	53.60	25.39	5.16	11.33	260.00
Jun-17	Ist	212.78	68.43	24.75	5.60	8.40	340.00	203.66	60.70	24.74	6.20	9.40	310.00	195.45	63.10	24.87	5.90	8.40	342.00
	IInd	232.36	49.10	17.76	14.03	6.52	240.00	228.10	63.32	17.73	17.73	8.24	450.00	214.27	66.36	23.89	17.43	8.10	300.00
Jul-17	Ist	191.31	62.90	20.44	6.40	8.50	325.00	190.33	60.70	20.46	6.80	7.50	364.00	188.03	62.50	16.58	5.40	7.20	380.00
	IInd	124.13	53.59	21.60	4.81	10.01	210.00	127.16	51.32	18.20	5.41	11.39	190.00	106.12	47.80	18.20	4.07	10.25	120.00
Aug-17	Ist	219.47	48.27	21.01	6.01	10.15	327.00	167.00	59.84	20.00	6.21	9.82	280.00	222.65	56.85	19.08	4.98	11.30	243.00
	IInd	152.48	53.81	17.84	5.84	12.26	220.00	129.06	50.32	22.10	4.85	13.56	250.00	178.35	51.05	23.01	3.95	12.04	190.00
Sep-17	Ist	210.83	66.48	24.47	6.21	9.41	316.00	214.01	59.50	24.87	4.12	9.11	310.00	200.92	56.57	20.70	6.10	11.30	275.00
	IInd	225.76	58.63	32.64	4.86	12.29	220.00	213.34	63.13	26.88	4.49	13.61	260.00	136.88	52.21	20.59	3.74	11.16	190.00

STACK MONITORING SPM

Month-Yr	Forthnig	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Apr-17	Ist	24.76	22.32	24.00
	IInd	21.99	21.95	19.77
May-17	Ist	24.67	20.00	22.56
	IInd	21.00	23.68	15.94
Jun-17	Ist	24.31	24.00	22.86
	IInd	24.94	24.94	19.64
Jul-17	Ist	27.38	23.21	18.20
	IInd	19.62	17.71	21.85
Aug-17	Ist	23.08	26.04	25.96
	IInd	25.29	20.35	23.81
Sep-17	Ist	23.81	27.29	24.00
	IInd	19.22	24.31	26.39

HINDUSTAN ZINC LIMITED
RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK: Oct-17 to Mar-18

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-17	Ist	374.16	88.40	41.37	7.84	19.60	280.00	281.37	83.81	32.60	8.21	15.50	340.00	271.94	82.65	49.24	8.66	18.10	360.00
	IInd	320.06	85.33	37.31	7.30	14.20	340.00	290.00	79 53	33.04	7.60	14.40	326.00	298.41	77.12	33.19	8.01	14.31	460.00
Nov-17	Ist	293.02	74.50	28.67	7.40	11.80	480.00	283.36	69.51	28.86	7.80	9.20	390.00	303.17	75.71	29.02	7 20	10.40	440.00
	IInd	284.36	79.24	41.92	4.20	14.42	330.00	287.96	87 14	46.13	5.78	16.62	570.00	333.06	79.05	47.85	4.16	12.17	310.00
Dec-17	Ist	295.61	75.12	37.46	6.90	8 20	465.00	277.44	76.19	37.05	6.60	8.20	420.00	280 47	70.05	41.20	5.90	9 50	470.00
	IInd	339.45	83.05	45.01	8.24	14.97	380.00	287.56	72.47	42.49	7.38	15.52	340.00	336.20	80.57	43.52	7.67	16.62	410.00
Jan-18	Ist	290.24	76.32	33.12	6.10	9.40	420.00	308.32	83.06	32.73	5.20	8.50	480.00	302.25	77.00	37.13	6.40	10.40	480.00
	IInd	272.06	84.61	37.65	7.31	15.61	350.00	349.54	81.24	40.22	7.50	16.25	410.00	376.94	79 40	34.44	8.41	16.10	340.00
Feb-18	Ist	257.87	88.13	36.83	7.78	17.11	385.00	220.78	73.08	34.20	6.52	15.46	260.00	349.88	76.81	32.98	7.78	17.81	280.00
	IInd	285.92	76.19	33.18	6.50	12.40	360.00	286.07	80.10	29.02	6 90	11.20	340.00	292.96	79.11	33.18	6.70	13.41	420.00
Mar-18	Ist	294.60	79.99	29.03	7.10	10.40	460.00	296.61	73.32	28.67	6.20	9.90	470.00	299.90	74.96	32.92	7.40	9.40	430.00
	IInd	322.44	82.73	34.68	9.66	15.11	310.00	314.94	85.58	32.38	8.18	15.15	360.00	305.46	87.14	39.74	7 15	13.72	250 00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-17	Ist	215.21	59.59	25.67	4.15	13.04	130.00	190.03	54.55	20.12	4 47	12.61	310.00	215.88	67.95	28.04	5.12	15.30	320.00
	IInd	199.21	52.78	28.98	5.20	10.20	234.00	205.06	55.02	20.63	5.10	9.40	340.00	216.35	55.15	28.90	5.90	12 10	280.00
Nov-17	Ist	213.68	59.16	24.58	4.90	7.20	360.00	214.60	62.02	24.57	5.20	6.50	290.00	198.12	61.00	20.73	4.50	6.40	305.00
	IInd	264.79	72.76	28.52	5.13	16.69	280.00	275 97	74.79	27.67	4.12	22.31	330.00	255.19	74.81	27.43	4.15	17.99	300.00
Dec-17	Ist	207.40	59.56	28.94	4.40	6.10	380.00	204.22	59.87	28.94	4.20	5.10	310.00	191.58	56.24	28.58	4.20	6.10	290.00
	IInd	168.90	66.45	27.84	5.21	10.82	230.00	190.21	50.40	21.81	4.75	11.58	190.00	210.55	63.29	25.24	5.30	4.79	210.00
Jan-18	Ist	208.74	62.09	28.78	4.80	9.00	340.00	187.36	56.24	24.87	6.50	8.40	290.00	205.37	61.49	24.78	5.40	8.50	310.00
	IInd	231.61	68.61	32.92	5.72	13.57	220.00	159.83	59.70	27.80	7.92	12.88	160.00	182.89	58.26	32.51	7.87	14.21	230.00
Feb-18	Ist	162.72	61.92	21.47	5.45	11.82	210.00	193.94	52.73	24.31	6.00	10.68	250.00	197.13	64.80	13.40	6 96	12.25	210.00
	IInd	199.99	57.02	24.77	3.41	6.70	260.00	185.14	55.42	24.85	4.50	8.40	330.00	203.95	59.60	20.46	6.60	10.20	280.00
Mar-18	Ist	196.74	63.65	24.76	6.60	8.40	335.00	195.73	59.94	28.95	6.10	8.80	320 00	196.08	63.73	20.82	6.20	7 90	290.00
	IInd	182 94	61.83	25.46	6.89	11 46	230 00	186.52	68.80	26.17	5.08	11.26	260.00	218 30	62.30	26.59	5.20	13 84	240.00

STACK MONITORING SPM

Month-Yr	Forthnig	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Oct-17	Ist	28.52	24.87	23.67
	IInd	23.26	24.60	20.41
Nov-17	Ist	28.00	26.53	21.88
	IInd	22.23	15.43	25 71
Dec-17	Ist	28.39	31.61	24.39
	IInd	27.68	24.30	22.73
Jul-17	Ist	30.95	36.19	30.16
	IInd	21 65	30.64	27.43
Aug-17	Ist	35.59	26.21	25.00
	IInd	31.25	34.44	29.41
Sep-17	Ist	30.22	26.67	23.65
	IInd	22.04	29 30	25.71

HINDUSTAN ZINC LIMITED
RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK: April-18 to Sep -18

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-18	Ist	327.63	86.22	37.36	11.60	12.00	400.00	309.41	82.51	28.79	11.20	12.40	480.00	310.12	83.40	33.19	11.30	12.50	417.00
	IInd	285.89	87.19	35.36	6.58	15.11	340.00	264.05	83.72	36.28	8.81	15.93	330.00	275.75	88.27	38.72	7.33	15.65	310.00
May-18	Ist	340.62	85.92	33.04	5.50	12.25	440.00	309.85	82.08	36.82	5.60	11.50	465.00	305.09	77.06	36.96	8.20	13.40	470.00
	IInd	359.97	91.53	34.82	7.85	19.36	450.00	344.37	81.40	39.86	8.06	18.44	430.00	330.79	83.64	40.52	8.89	19.08	410.00
Jun-18	Ist	304.88	79.63	33.17	5.90	11.10	410.00	290.73	76.12	33.04	6.20	8.90	410.00	300.48	80.26	37.17	7.60	12.40	435.00
	IInd	312.00	80.31	35.24	7.65	17.80	340.00	278.00	78.52	33.56	7.46	16.40	370.00	322.00	85.21	36.79	8.11	17.85	410.00
Jul-18	Ist	216.42	75.51	33.24	9.10	14.33	400.00	221.21	79.56	29.03	6.90	15.30	350.00	236.91	88.74	33.27	7.90	14.40	390.00
	IInd	150.01	57.91	7.79	7.79	11.93	290.00	160.63	61.69	26.14	7.23	13.48	240.00	150.01	57.91	21.82	5.75	11.30	260.00
Aug-18	Ist	232.17	84.54	29.15	6.60	14.33	390.00	225.83	82.87	24.77	5.80	4.40	310.00	205.69	77.88	29.01	6.50	12.10	260.00
	IInd	216.58	74.64	27.32	6.90	12.42	270.00	221.48	76.24	28.53	7.00	12.36	270.00	235.03	79.41	26.26	6.60	14.08	280.00
Sep-18	Ist	230.92	74.91	33.04	5.60	8.60	360.00	211.37	75.78	29.03	6.00	5.40	310.00	230.50	82.87	28.78	6.40	12.40	340.00
	IInd	251.29	61.70	34.78	3.45	19.89	440.00	152.68	71.78	29.96	5.41	12.66	530.00	203.25	65.24	33.99	5.70	17.95	350.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-18	Ist	211.00	76.52	24.85	7.40	8.20	290.00	214.74	71.78	20.46	6.60	8.90	310.00	210.69	72.75	24.77	7.00	8.10	320.00
	IInd	214.58	73.53	25.08	5.29	11.95	250.00	230.98	64.40	20.56	5.09	11.85	230.00	245.35	66.82	24.56	5.75	13.38	240.00
May-18	Ist	203.82	62.16	29.15	7.40	8.40	340.00	207.87	67.57	24.87	7.00	8.40	340.00	190.67	62.30	29.00	6.60	8.00	280.00
	IInd	211.85	68.23	27.78	7.59	12.75	210.00	209.27	69.88	26.83	7.67	11.80	220.00	240.13	66.41	30.15	6.45	13.74	240.00
Jun-18	Ist	211.00	63.17	20.82	5.50	7.40	260.00	188.76	60.38	24.79	5.20	7.60	230.00	196.49	59.50	28.80	5.40	8.40	230.00
	IInd	212.00	65.42	28.92	6.31	13.55	230.00	176.00	61.25	25.72	5.68	10.53	170.00	182.00	63.95	26.12	5.60	11.36	180.00
Jul-18	Ist	136.34	57.82	28.97	7.21	8.79	218.00	187.71	79.44	28.68	10.70	14.10	260.00	169.58	64.15	33.32	10.90	14.00	200.00
	IInd	130.53	50.20	24.62	6.16	9.85	140.00	114.58	54.51	23.48	4.33	11.31	150.00	134.21	49.69	27.01	4.13	10.11	160.00
Aug-18	Ist	167.42	57.33	24.86	6.50	7.40	360.00	175.60	73.68	20.64	6.80	14.10	360.00	171.12	67.02	24.55	6.60	10.10	340.00
	IInd	170.13	53.71	22.39	4.88	12.88	210.00	109.83	61.21	11.94	3.05	12.27	190.00	180.16	65.23	25.17	4.99	11.74	180.00
Sep-18	Ist	185.09	64.70	20.46	6.10	9.40	240.00	186.16	63.06	24.73	6.10	9.40	240.00	188.84	63.03	20.73	6.10	6.40	210.00
	IInd	231.27	69.99	29.41	3.65	19.93	290.00	253.83	72.17	33.06	4.64	16.90	360.00	242.43	63.89	32.97	5.82	18.52	280.00

STACK MONITORING SPM

Month-Yr	Forthnig	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Apr-18	Ist	17.32	28.63	26.85
	IInd	23.05	29.17	25.00
May-18	Ist	37.14	43.43	27.62
	IInd	31.29	26.41	32.00
Jun-18	Ist	32.00	23.21	21.90
	IInd	29.52	28.30	23.47
Jul-18	Ist	32.42	38.98	26.48
	IInd	17.66	31.84	33.33
Aug-18	Ist	21.36	23.05	19.86
	IInd	23.70	24.81	18.18
Sep-18	Ist	25.81	34.79	25.14
	IInd	26.06	32.67	22.41

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK : October-18 to March-19

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-18	Ist	214.08	65.97	28.85	8.19	8.60	290.00	238.22	80.88	27.34	7.44	9.80	380.00	246.09	73.22	31.56	7.22	13.01	298.00
	IInd	270.11	79.15	27.61	6.11	14.07	350.00	275.17	79.86	27.76	5.82	17.16	340.00	236.00	71.95	39.47	5.91	16.41	360.00
Nov-18	Ist	220.11	74.83	32.73	6.40	5.50	320.00	215.41	71.06	33.17	5.40	6.80	370.00	236.25	75.23	29.03	5.50	5.20	320.00
	IInd	387.15	83.36	30.76	5.86	14.07	280.00	245.14	78.60	33.47	5.92	13.34	340.00	267.40	76.05	39.53	6.50	14.85	290.00
Dec-18	Ist	214.94	73.78	33.13	6.20	8.40	350.00	224.03	76.19	28.90	6.20	11.10	330.00	236.59	84.49	32.73	6.00	5.40	360.00
	IInd	266.61	73.07	30.52	6.01	15.87	310.00	258.96	75.67	36.45	8.32	16.40	340.00	275.46	68.39	32.09	7.11	16.86	300.00
Jan-19	Ist	232.24	76.39	32.73	6.80	7.00	360.00	223.57	73.83	29.00	5.50	9.50	340.00	222.96	79.99	33.14	5.40	9.80	380.00
	IInd	259.14	92.03	34.62	6.06	15.83	320.00	240.49	83.02	42.65	5.71	16.62	310.00	246.53	83.15	33.00	6.54	16.00	300.00
Feb-19	Ist	317.00	84.00	36.80	7.82	18.40	390.00	287.00	80.31	35.24	7.65	15.80	350.00	345.00	87.45	38.74	9.13	20.40	310.00
	IInd	261.62	85.33	33.18	8.20	14.10	330.00	228.10	73.58	33.18	6.40	10.40	380.00	264.30	84.49	33.18	8.20	11.40	370.00
Mar-19	Ist	234.76	83.67	32.78	6.80	7.40	270.00	225.83	82.87	33.09	5.60	8.40	364.00	236.24	75.05	33.04	6.60	8.40	375.00
	IInd	248.00	77.64	34.25	7.33	18.70	380.00	246.35	73.46	36.40	7.60	16.34	370.00	326.00	82.40	43.40	7.33	18.70	380.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-18	Ist	257.42	66.79	24.44	11.70	13.90	370.00	203.33	65.64	20.68	5.11	11.20	200.00	185.05	67.74	20.79	4.22	7.90	220.00
	IInd	198.06	56.82	26.44	4.87	12.09	210.00	170.10	54.00	17.64	4.93	9.58	210.00	176.14	49.54	29.24	3.14	10.91	180.00
Nov-18	Ist	199.70	66.07	24.87	4.50	6.40	340.00	206.80	65.64	24.87	5.00	7.20	255.00	189.79	65.67	24.54	4.50	6.20	240.00
	IInd	181.66	60.23	21.38	4.49	10.55	160.00	278.16	71.99	25.36	5.75	11.11	310.00	213.08	68.90	28.34	5.23	13.38	210.00
Dec-18	Ist	188.90	65.77	24.67	5.50	6.00	220.00	194.85	61.42	24.66	4.50	6.20	210.00	194.64	65.04	24.85	4.60	5.90	210.00
	IInd	167.02	51.89	23.58	4.44	11.88	180.00	142.16	55.24	22.52	5.89	11.37	190.00	149.89	56.24	22.70	6.19	10.75	140.00
Jan-19	Ist	183.92	66.34	20.63	4.50	6.20	190.00	189.00	68.22	24.55	5.20	8.20	230.00	187.37	62.37	20.46	4.20	7.50	225.00
	IInd	181.68	70.14	23.71	5.68	12.81	240.00	183.26	57.59	28.19	4.40	11.03	180.00	150.77	59.70	25.92	7.13	12.82	190.00
Feb-19	Ist	176.00	63.47	25.42	6.10	12.30	240.00	187.00	67.20	26.80	6.55	12.30	190.00	182.00	66.47	27.40	5.87	12.80	250.00
	IInd	213.44	67.67	24.77	4.20	6.40	290.00	210.47	67.51	24.85	5.20	7.50	246.00	196.60	66.88	20.46	4.50	6.60	190.00
Mar-19	Ist	198.99	67.11	24.88	6.40	8.20	224.00	191.11	67.08	24.88	6.40	8.50	240.00	183.93	59.60	24.82	6.50	7.10	290.00
	IInd	197.00	67.20	26.67	6.33	13.60	250.00	177.00	64.58	23.47	5.22	12.83	210.00	165.00	61.40	22.74	5.40	10.78	210.00

STACK MONITORING SPM

Month-Yr	Forthnig	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Oct-18	Ist	25.29	26.56	26.56
	IInd	19.13	33.27	33.27
Nov-18	Ist	33.14	31.43	28.33
	IInd	23.10	33.77	38.02
Dec-18	Ist	39.05	36.46	24.29
	IInd	25.58	34.97	30.48
Jan-19	Ist	32.14	38.10	31.23
	IInd	26.33	38.80	39.05
Feb-19	Ist	28.74	31.20	17.96
	IInd	23.81	22.86	57.50
Mar-19	Ist	37.50	42.86	32.77
	IInd	33.28	43.56	35.00

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK : April-19 to Sep-19

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-19	Ist	231.30	79.99	36.82	7.40	9.80	310.00	231.37	84.17	33.07	5.60	8.40	374.00	239.92	79.66	33.31	6.60	8.40	375.00
	IInd	265.24	78.37	35.90	7.18	14.85	320.00	222.94	70.12	35.44	2.95	14.78	340.00	286.15	87.16	34.28	5.81	13.35	380.00
May-19	Ist	241.45	86.94	37.33	8.80	7.80	366.00	233.14	83.87	37.31	6.80	10.10	342.00	226.20	83.67	37.26	7.00	9.50	410.00
	IInd	258.45	82.58	24.52	6.37	10.17	310.00	254.81	90.75	30.50	6.12	12.82	290.00	291.67	87.00	32.02	4.26	17.44	320.00
Jun-19	Ist	249.60	88.41	33.09	8.20	10.20	340.00	243.94	77.75	32.73	7.00	12.00	360.00	226.20	83.67	29.02	7.00	9.50	410.00
	IInd	278.26	81.20	47.79	7.52	15.38	310.00	227.10	84.91	37.46	6.86	15.56	320.00	267.95	83.06	42.16	6.25	18.04	310.00
Jul-19	Ist	203.33	68.98	33.18	6.60	7.30	290.00	196.11	67.51	24.88	6.40	12.40	290.00	197.75	68.16	29.03	5.50	7.30	310.00
	IInd	106.59	70.67	34.74	3.00	8.50	280.00	90.26	53.55	18.97	3.38	10.96	310.00	112.44	63.99	29.97	3.50	9.16	270.00
Aug-19	Ist	131.10	64.38	21.66	5.46	10.93	240.00	126.80	70.01	24.17	5.16	12.82	260.00	173.86	60.35	22.56	7.32	10.08	210.00
	IInd	198.65	68.18	28.77	6.20	8.20	290.00	183.99	67.15	24.87	5.50	8.40	310.00	199.03	65.06	24.98	4.50	9.50	270.00
Sep-19	Ist	191.01	67.06	33.17	5.40	10.20	290.00	197.61	68.16	24.77	5.50	10.40	240.00	212.74	82.87	29.02	4.20	8.40	360.00
	IInd	155.09	58.82	23.93	6.60	16.08	260.00	150.60	65.67	21.43	4.36	12.65	240.00	111.91	54.90	20.44	6.60	12.80	320.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-19	Ist	197.98	76.19	28.99	6.60	7.60	280.00	191.21	67.08	24.75	6.40	8.50	240.00	183.93	59.60	29.03	6.50	7.10	290.00
	IInd	204.45	69.67	31.39	5.25	9.87	210.00	177.00	64.58	23.60	5.22	12.83	210.00	165.00	61.40	34.10	5.40	10.78	210.00
May-19	Ist	204.96	76.59	24.91	5.50	7.80	230.00	199.52	66.24	28.89	7.60	6.40	240.00	181.55	62.43	24.58	6.40	7.00	250.00
	IInd	188.17	67.97	24.76	6.11	11.15	150.00	179.61	64.96	26.08	7.86	11.08	170.00	196.87	73.77	24.01	5.21	14.59	160.00
Jun-19	Ist	193.58	66.64	24.17	4.00	8.00	235.00	207.41	67.59	33.01	6.00	8.50	265.00	190.04	66.24	24.76	4.60	9.00	290.00
	IInd	190.72	71.93	31.71	4.26	13.81	210.00	201.91	67.66	24.37	14.10	12.38	190.00	197.16	66.50	24.31	5.92	12.38	200.00
Jul-19	Ist	174.33	57.08	20.71	4.60	6.30	250.00	186.30	60.23	28.78	5.30	7.40	265.00	189.66	60.14	20.74	4.60	9.30	27.00
	IInd	155.45	44.18	23.03	5.40	20.32	330.00	204.77	57.67	29.64	7.96	17.93	320.00	195.56	64.92	28.37	8.23	15.01	300.00
Aug-19	Ist	131.20	56.32	24.55	5.13	10.43	150.00	125.52	43.74	16.36	5.12	10.25	190.00	135.88	45.10	20.46	5.11	8.03	130.00
	IInd	174.28	60.23	28.11	4.80	7.40	230.00	168.27	57.76	21.87	6.00	8.50	190.00	164.00	53.49	20.11	4.40	7.40	190.00
Sep-19	Ist	172.61	56.16	20.71	4.20	7.80	240.00	166.01	49.34	20.45	5.20	6.40	215.00	176.68	52.88	24.87	6.40	8.20	264.00
	IInd	113.96	43.72	23.77	5.27	9.67	170.00	99.45	41.21	21.81	4.19	8.28	150.00	116.54	42.15	15.46	5.03	9.72	130.00

STACK MONITORING SPM

Month-Yr	Forth	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Apr-19	Ist	27.94	37.50	37.50
	IInd	36.10	41.24	41.84
May-19	Ist	38.24	39.05	27.62
	IInd	40.43	28.36	35.71
Jun-19	Ist	29.76	38.00	42.86
	IInd	38.79	25.89	27.32
Jul-19	Ist	31.43	36.84	26.79
	IInd	27.30	36.01	33.33
Aug-19	Ist	26.29	24.05	25.89
	IInd	20.63	25.83	34.29
Sep-19	Ist	38.66	31.67	22.86
	IInd	38.79	35.27	24.48

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK : Oct-2019 to March 2020

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-19	Ist	17.05	67.06	32.88	5.40	10.20	290.00	209.33	74.85	28.90	6.60	12.40	340.00	206.51	82.39	29.03	4.20	8.40	370.00
	IInd	218.36	86.79	34.35	5.22	12.90	320.00	231.41	81.62	37.87	4.98	13.03	320.00	234.16	80.28	34.66	4.71	14.59	310.00
Nov-19	Ist	202.59	68.31	32.74	6.20	10.40	350.00	210.85	69.78	28.90	6.20	11.40	350.00	212.85	78.48	28.78	5.50	10.40	305.00
	IInd	193.20	85.83	35.11	4.97	14.65	230.00	187.93	74.24	28.88	5.30	14.40	320.00	238.10	76.19	32.29	5.54	13.63	220.00
Dec-19	Ist	206.80	71.11	32.87	4.40	12.20	380.00	213.23	74.27	33.03	4.20	10.20	330.00	221.69	78.59	37.16	5.20	9.80	340.00
	IInd	182.39	78.38	36.75	3.06	15.89	270.00	199.23	69.62	39.21	2.75	14.54	260.00	293.99	83.32	44.56	3.65	17.45	280.00
Jan-20	Ist	212.27	71.25	36.75	5.20	9.20	390.00	203.99	68.91	32.89	5.30	8.80	320.00	205.03	71.06	36.83	3.80	8.20	320.00
	IInd	275.94	79.82	41.23	4.50	11.54	340.00	205.78	84.04	29.89	3.94	9.46	270.00	294.73	79.88	42.06	5.40	11.80	370.00
Feb-20	Ist	212.94	69.04	37.00	5.40	8.20	380.00	212.92	71.13	34.14	5.20	7.20	330.00	220.35	72.65	33.17	4.20	6.40	360.00
	IInd	269.32	87.16	34.30	3.99	15.32	350.00	252.90	84.03	36.53	5.02	14.93	370.00	283.13	86.97	34.44	3.57	14.44	260.00
Mar-20	Ist	279.46	68.84	32.67	5.10	15.20	370.00	289.17	68.43	33.15	5.40	11.40	330.00	277.71	67.71	37.25	7.80	16.20	350.00
	IInd	281.12	73.12	33.32	8.00	14.50	420.00	294.40	67.31	28.76	8.40	8.30	290.00	273.90	73.52	32.77	6.20	12.00	390.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Oct-19	Ist	187.10	60.74	29.03	5.10	8.10	260.00	184.16	52.35	20.73	5.50	7.80	201.00	181.70	55.34	20.46	7.20	8.10	230.00
	IInd	153.88	66.28	25.47	5.38	13.87	190.00	150.67	52.76	18.25	3.81	12.04	170.00	183.70	51.87	22.03	7.11	10.87	140.00
Nov-19	Ist	187.10	60.75	28.68	5.10	8.10	260.00	184.16	52.35	20.47	5.50	7.80	201.00	181.70	55.35	20.73	7.20	8.10	230.00
	IInd	159.29	69.07	21.35	5.81	9.18	350.00	112.31	57.32	22.20	8.15	9.28	180.00	151.62	63.20	23.36	7.45	11.34	140.00
Dec-19	Ist	179.62	63.10	24.87	4.80	7.20	280.00	182.09	59.03	24.56	4.20	8.40	230.00	176.32	55.03	24.87	6.30	6.80	222.00
	IInd	208.96	66.07	26.30	3.78	8.69	260.00	188.17	60.09	25.27	3.46	11.64	240.00	178.77	65.33	24.42	3.49	13.85	270.00
Jan-20	Ist	180.96	63.44	20.56	3.20	6.60	210.00	168.34	56.29	24.99	3.50	8.40	220.00	183.32	62.84	20.63	4.20	7.40	210.00
	IInd	157.04	62.50	17.00	4.06	8.15	180.00	166.72	60.78	24.56	5.71	9.14	250.00	172.00	55.96	26.07	5.71	8.70	260.00
Feb-20	Ist	181.89	61.63	20.55	3.80	5.40	210.00	172.68	56.29	24.87	4.50	4.90	260.00	165.15	55.75	24.67	3.80	4.20	250.00
	IInd	157.67	63.67	17.12	2.78	10.26	240.00	125.20	52.32	24.56	2.59	11.02	240.00	156.05	77.67	29.43	4.30	13.46	260.00
Mar-20	Ist	182.49	59.70	24.66	4.40	8.00	190.00	169.14	54.89	24.99	4.80	8.80	201.00	170.61	55.15	20.64	4.20	8.40	190.00
	IInd	191.81	60.95	20.54	5.60	9.60	220.00	179.09	53.29	24.51	6.40	12.40	270.00	177.52	53.13	20.45	5.40	9.60	260.00

STACK MONITORING SPM

Month-Yr	Forth	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Oct-19	Ist	38.10	34.69	32.38
	IInd	44.09	28.40	34.80
Nov-19	Ist	31.43	34.69	32.38
	IInd	27.62	27.90	15.61
Dec-19	Ist	21.43	18.73	29.17
	IInd	15.24	15.10	18.51
Jan-20	Ist	39.05	41.02	34.48
	IInd	26.35	26.88	14.11
Feb-20	Ist	42.21	36.19	27.06
	IInd	30.56	33.33	38.69
Mar-20	Ist	25.66	29.67	26.72
	IInd	21.43	34.00	25.33

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

Annexure- III

AIR MONITORING : AMBIENT AIR & STACK : April-2020 to Sep-2020

Location->		Mine Site						Main Gate						Mine Tower					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-20	Ist	225.73	63.71	28.59	4.20	7.20	260.00	221.69	60.63	33.17	3.80	6.60	230.00	238.94	60.61	37.33	4.00	6.80	280.00
	IInd	295.24	69.71	37.31	4.40	8.20	330.00	293.02	68.23	32.89	4.80	8.20	310.00	286.32	70.38	36.84	6.20	8.00	310.00
May-20	Ist	287.45	68.76	32.89	7.00	7.20	346.00	235.24	67.51	29.00	4.80	6.60	270.00	266.11	67.69	32.89	5.20	6.40	290.00
	IInd	283.99	73.25	33.17	6.60	5.40	324.00	264.03	71.08	34.13	4.40	5.80	290.00	289.76	71.76	37.29	5.40	7.20	340.00
Jun-20	Ist	297.03	74.74	37.00	7.00	7.20	415.00	285.95	74.75	37.28	5.80	8.60	310.00	276.23	70.32	37.15	6.40	9.00	410.00
	IInd	292.41	68.43	32.76	8.30	8.40	390.00	291.26	71.83	34.42	6.40	7.50	410.00	279.71	71.25	36.69	5.80	7.40	370.00
Jul-20	Ist	192.85	71.92	35.90	6.38	13.20	310.00	240.92	81.93	31.81	8.85	11.98	340.00	227.07	84.74	29.47	6.31	10.44	270.00
	IInd	289.46	72.65	28.77	9.10	10.40	320.00	277.38	69.64	30.12	6.40	10.50	410.00	286.07	85.09	25.33	7.80	11.50	350.00
Aug-20	Ist	228.36	74.03	37.00	8.21	9.50	250.00	206.58	76.32	34.19	6.40	10.50	410.00	261.42	78.86	37.15	8.89	12.11	330.00
	IInd	158.98	66.52	20.00	4.81	11.12	220.00	159.11	63.42	25.58	6.31	13.42	250.00	137.43	61.74	19.94	4.85	13.32	240.00
Sep-20	Ist	210.02	59.60	37.00	4.20	8.40	370.00	286.07	80.10	34.19	6.66	10.67	260.00	227.36	81.53	37.15	5.99	10.10	330.00
	IInd	231.67	83.94	32.76	4.34	13.00	430.00	187.89	86.54	26.71	4.67	14.26	370.00	205.19	80.36	27.43	5.05	13.43	380.00

Location->		Agucha village						Kothiyan village						Bherukhera village					
month/		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
year	week	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-20	Ist	158.43	49.97	28.76	2.20	4.60	190.00	169.14	54.89	29.15	4.80	8.80	201.00	170.61	55.15	20.64	4.20	8.40	190.00
	IInd	191.81	60.95	24.67	5.60	9.60	220.00	179.09	53.29	28.76	6.40	12.40	270.00	177.52	53.13	28.64	5.40	9.60	260.00
May-20	Ist	185.30	62.97	28.78	4.40	6.60	255.00	185.14	62.30	24.56	4.40	7.80	290.00	173.07	57.39	23.59	6.40	8.20	260.00
	IInd	186.62	62.30	28.64	5.60	5.40	275.00	182.36	53.35	25.00	4.40	6.20	310.00	167.55	50.37	28.65	5.50	7.20	290.00
Jun-20	Ist	179.61	62.10	29.04	4.20	7.20	270.00	188.84	59.09	28.65	5.40	7.60	230.00	179.09	58.96	27.52	5.20	6.40	230.00
	IInd	187.84	60.21	28.64	5.40	5.20	210.00	169.54	57.76	25.00	4.20	5.40	260.00	175.52	56.03	24.58	4.20	5.10	190.00
Jul-20	Ist	194.29	62.36	25.37	4.02	10.35	180.00	160.92	65.87	26.62	4.01	10.44	150.00	139.00	52.49	22.40	2.45	8.11	310.00
	IInd	171.34	48.94	33.36	6.18	8.12	240.00	162.28	49.42	29.82	5.21	7.43	220.00	179.68	56.09	24.47	5.11	7.32	220.00
Aug-20	Ist	148.19	71.87	15.65	4.89	5.40	240.00	160.66	57.76	20.46	6.32	8.33	190.00	171.70	56.03	23.59	5.30	6.80	210.00
	IInd	94.12	39.80	14.10	3.33	9.18	150.00	91.00	38.93	17.71	1.72	8.47	130.00	103.93	46.43	18.15	2.37	7.02	160.00
Sep-20	Ist	166.47	78.93	15.65	7.43	5.12	220.00	163.16	68.91	20.46	8.18	3.99	190.00	205.10	75.58	23.59	10.42	8.18	210.00
	IInd	129.94	55.06	20.22	5.66	9.43	170.00	131.70	48.45	22.79	4.55	8.55	150.00	144.46	52.55	20.46	6.19	10.73	170.00

STACK MONITORING SPM

Month-Yr	Forth	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Apr-20	Ist	36.46	37.71	38.10
	IInd	28.57	33.62	20.28
May-20	Ist	28.51	23.15	25.79
	IInd	23.08	26.04	35.42
Jun-20	Ist	27.43	36.13	29.33
	IInd	32.30	28.77	33.33
Jul-20	Ist	22.70	28.17	27.14
	IInd	30.17	32.26	30.21
Aug-20	Ist	29.41	33.78	22.73
	IInd	21.69	28.02	25.48
Sep-20	Ist	23.96	26.39	24.00
	IInd	22.79	28.09	21.74

DG SET STACK MONITORING

Month	CO (mg/Nm3)	Particular Matter, (mg/Nm3)	NOx, (ppm)	NMHC (mg/Nm3)
Sep-20	86.00	51.34	236.00	27.00

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HINDUSTAN ZINC LIMITED

HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINE

AIR MONITORING : AMBIENT AIR & STACK : October 2020 to March 2021

Annexure III

Location		Mine Site						Main Gate						Mine Tower					
month/ year	Fortnight	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)
Oct-2020	Ist	316.97	88.74	37.00	11.80	14.00	340.00	199.39	89.59	34.19	7.11	10.67	260.00	139.99	59.13	37.15	8.10	8.90	180.00
	IInd	314.20	75.43	44.16	4.21	14.93	240.00	241.58	85.42	47.15	3.50	18.90	270.00	226.49	74.54	37.59	4.52	15.31	270.00
Nov-2020	Ist	254.87	71.48	40.41	4.41	14.20	280.00	228.64	76.10	36.02	2.76	10.06	290.00	244.80	76.75	40.51	4.15	14.28	310.00
	IInd	249.46	82.45	28.77	5.88	11.13	240.00	238.13	74.23	30.12	4.39	14.11	220.00	232.17	76.32	25.33	3.56	10.54	270.00
Dec-2020	Ist	225.25	76.46	28.86	11.50	13.60	218.00	182.60	74.14	29.02	10.30	13.80	280.00	236.45	82.72	28.67	11.80	13.20	210.00
	IInd	230.57	72.82	36.37	3.23	15.77	310.00	204.25	81.16	39.97	3.33	16.26	390.00	173.90	64.07	27.86	3.23	15.27	410.00
Jan-2021	Ist	212.89	81.29	32.71	8.88	13.10	280.00	230.53	84.56	28.76	5.11	11.50	290.00	213.52	76.59	29.14	7.34	15.60	350.00
	IInd	232.83	77.69	36.90	3.16	17.49	350.00	228.42	75.08	32.21	3.03	16.26	270.00	250.47	78.51	45.56	3.35	16.26	410.00
Feb-2021	Ist	281.11	69.24	37.00	5.60	9.50	350.00	268.70	66.84	34.61	4.30	7.10	390.00	268.19	67.53	37.15	6.40	8.20	410.00
	IInd	215.08	75.38	36.06	3.09	11.90	330.00	290.61	76.72	29.88	4.08	14.80	340.00	305.15	71.89	31.79	4.90	14.16	360.00
Mar-2021	Ist	236.25	75.23	28.69	5.50	5.20	320.00	236.91	88.74	37.34	4.98	13.03	320.00	243.33	85.96	33.11	11.30	13.20	280.00
	IInd	215.48	78.94	27.66	2.89	12.98	280.00	230.46	78.19	31.23	4.55	13.50	350.00	233.94	75.01	34.29	3.53	12.69	340.00

Location-		Agucha village						Kothiya village						Bherukhera village					
month/ year	Fortnight	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)
Oct-2020	Ist	161.98	79.80	15.65	11.20	13.50	234.00	128.31	52.98	20.46	7.50	9.90	225.00	131.94	54.61	24.68	7.10	10.30	110.00
	IInd	172.34	72.90	27.59	4.23	13.21	180.00	164.43	53.16	19.17	5.60	8.82	210.00	119.19	58.83	25.61	3.42	10.91	190.00
Nov-2020	Ist	219.83	74.00	31.38	3.07	16.16	290.00	186.72	63.63	30.85	3.82	14.23	290.00	144.38	58.17	26.88	3.26	10.00	290.00
	IInd	175.60	73.68	33.36	4.11	13.42	260.00	185.05	67.74	29.82	3.58	11.17	270.00	213.68	59.16	24.47	4.02	12.11	280.00
Dec-2020	Ist	135.52	56.36	20.73	8.50	10.40	180.00	133.11	55.62	24.58	7.40	9.70	403.00	135.55	56.51	24.57	7.80	9.90	190.00
	IInd	196.31	61.49	26.74	3.17	13.69	250.00	189.44	60.08	34.95	3.18	15.33	280.00	193.66	64.04	32.25	3.18	14.48	290.00
Jan-2021	Ist	150.53	63.45	20.70	2.37	7.02	160.00	156.05	66.79	24.65	6.32	8.33	190.00	156.70	63.12	20.47	3.33	9.18	150.00
	IInd	171.51	68.81	24.02	2.70	13.70	250.00	183.00	63.00	26.05	3.67	11.43	290.00	135.60	63.52	23.58	3.45	11.83	220.00
Feb-2021	Ist	174.49	63.71	29.04	5.50	8.80	270.00	184.87	62.10	28.65	5.10	7.20	278.00	174.74	60.38	27.52	6.60	8.40	275.00
	IInd	149.69	63.05	22.48	4.45	13.11	250.00	157.56	59.09	16.70	3.80	10.25	240.00	154.36	62.14	25.87	2.47	13.79	220.00
Mar-2021	Ist	209.20	59.70	34.21	6.40	10.50	270.00	141.76	62.37	33.26	8.00	10.20	194.00	187.36	56.24	28.30	6.50	8.40	170.00
	IInd	193.35	67.73	23.81	3.89	10.11	260.00	122.35	58.60	17.92	4.69	9.94	210.00	170.59	64.73	24.53	3.92	9.82	190.00

STACK MONITORING SPM

Month-Yr	Fortnight	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Oct-2020	Ist	23.47	29.52	37.14
	IInd	34.63	33.74	34.20
Nov-2020	Ist	26.73	30.67	34.31
	IInd	29.47*	32.47	31.25
Dec-2020	Ist	34.93	30.57	34.57
	IInd	38.23	38.26	37.84
Jan-2021	Ist	34.04	35.93	32.62
	IInd	36.57	39.68	35.78
Feb-2021	Ist	30.12	39.58	30.30
	IInd	23.75	33.21	35.61
Mar-2021	Ist	37.21	36.76	32.80
	IInd	23.02	46.97	34.39

DG SET STACK MONITORING

Month	CO (mg/Nm3)	Particular Matter, (mg/Nm3)	NOx, (ppm)	NMHC (mg/Nm3)
Nov-20	120	46.38	255	32
Dec-20	131	39.44	295	45
Feb-21	96	53.6	365	28

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6062**
Report On : **04/09/2018**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **14/08/2018** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Main Gate of Unit** Collected on **06/08/2018**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **04/09/2018** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Particulate Matter (PM10) µg/m3	83
2	Sulphur Dioxide as SO2 ug/m3	7.2
3	NO2 ug/m3	41.3

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **04/09/2018**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6063**
Report On : **04/09/2018**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **14/08/2018** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Mine Pit of Unit** Collected on **06/08/2018**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **04/09/2018** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Particulate Matter (PM10) µg/m3	75
2	Sulphur Dioxide as SO2 ug/m3	6.5
3	NO2 ug/m3	32.5

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **04/09/2018**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6064**
Report On : **04/09/2018**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **14/08/2018** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Mine Tower of Unit** Collected on **06/08/2018**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **04/09/2018** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Particulate Matter (PM10) µg/m3	67
2	Sulphur Dioxide as SO2 ug/m3	6.2
3	NO2 ug/m3	31.4

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **04/09/2018**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6664**
Report On : **18/12/2019**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **02/12/2019** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality monitoring at main gate of the unit** Collected on **25/11/2019**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/12/2019** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	43.2
2	Particulate Matter (PM10) µg/m3	75
3	Sulphur Dioxide as SO2 ug/m3	9.8
4	Suspended Particulate Matter µg/m3	325

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **18/12/2019**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

सूचना का अधिकार अधिनियम, 2005
के तहत जारी दस्तावेज

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6665**
Report On : **18/12/2019**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **02/12/2019** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Agucha Village** Collected on **25/11/2019**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/12/2019** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	31.4
2	Particulate Matter (PM10) µg/m3	79
3	Sulphur Dioxide as SO2 ug/m3	9.4
4	Suspended Particulate Matter µg/m3	322

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **18/12/2019**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6666**
Report On : **18/12/2019**

I hereby certify that I **S. N. Tikkiwal.** State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **02/12/2019** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Kothiya Village** Collected on **25/11/2019**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/12/2019** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	32.1
2	Particulate Matter (PM10) µg/m3	84
3	Sulphur Dioxide as SO2 ug/m3	9.4
4	Suspended Particulate Matter µg/m3	378

The condition of the seals. fastening and container on receipt was as follows : **Intact**

Signed This On **18/12/2019**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6667**
Report On : **18/12/2019**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **02/12/2019** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Bherukheda Village** Collected on **25/11/2019**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/12/2019** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	28.1
2	Particulate Matter (PM10) µg/m3	91
3	Sulphur Dioxide as SO2 ug/m3	8.8
4	Suspended Particulate Matter µg/m3	425

e condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/12/2019**

BOARD ANALYST
Rajasthan State Pollution Control Board
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4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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सूचना का अधिकार अधिनियम, 2005
के तहत जारी दस्तावेज
रा. प्र. नि. मं. भीलवाड़ा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **6669**
Report On : **18/12/2019**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **02/12/2019** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at mine tower of the unit** Collected on **25/11/2019**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/12/2019** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	32.4
2	Particulate Matter (PM10) µg/m3	93
3	Sulphur Dioxide as SO2 ug/m3	9.4
4	Suspended Particulate Matter µg/m3	468

e condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/12/2019**

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Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
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सूचना का अधिकार अधिनियम, 2005
के तहत जारी दस्तावेज
(3)
रा. प्र. नि. मं. भीलवाड़ा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

.eport No. : **7169**
Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring near main gate** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	41.1
2	Particulate Matter (PM10) µg/m3	90
3	Sulphur Dioxide as SO2 ug/m3	8.9
4	Suspended Particulate Matter µg/m3	394

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **22/01/2021**

BOARD ANALYST

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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

.eport No. : **7170**
Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Mine Tower** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	33.0
2	Particulate Matter (PM10) µg/m3	92
3	Sulphur Dioxide as SO2 ug/m3	7.2
4	Suspended Particulate Matter µg/m3	460

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **22/01/2021**

BOARD ANALYST
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)

Final Report

.eport No. : **7171**

Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring at Mine Pit** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	30.2
2	Particulate Matter (PM10) µg/m3	72
3	Sulphur Dioxide as SO2 ug/m3	6.8
4	Suspended Particulate Matter µg/m3	424

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **22/01/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
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4, Institutional Area, Jhalana Doongari,
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

eport No. : **7172**
Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **Kothiya Village , Tehsil-Shahpura , District-Bhilwara** Collected from **Ambient Air Quality Monitoring at Village Kotia** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	26.3
2	Particulate Matter (PM10) µg/m3	66
3	Sulphur Dioxide as SO2 ug/m3	6.8

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **22/01/2021**

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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

.eport No. : **7173**
Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **Agucha Village , Tehsil-Hurda , District-Bhilwara** Collected from **Ambient Air Quality Monitoring at Village Agucha** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	32.1
2	Particulate Matter (PM10) µg/m3	76
3	Sulphur Dioxide as SO2 ug/m3	7.2

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **22/01/2021**

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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)
Final Report

Report No. : **7174**
Report On : **22/01/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **05/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Ambient Air Quality** of **Bherukheda Village , Tehsil-Hurda , District-Bhilwara** Collected from **Ambient Air Quality Monitoring at Village Bherulkheda** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **22/01/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO2 µg/M3	30.9
2	Particulate Matter (PM10) µg/m3	64
3	Sulphur Dioxide as SO2 ug/m3	7.3

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **22/01/2021**

BOARD ANALYST

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HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-Apr-2017 to Sep-2017

S. No	1		2		3		4		5		6	
Code	GWD		HP-1		WW-16		WW-23		PRK1		KOT-1	
Month	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17
pH	7.90	7.40	7.50	7.90	7.60	7.90	7.90	7.50	7.10	7.90	7.40	8.10
Alkalinity	360	345	254	298	342	321	339	354	420	404	384	344
Chlorides	182	162	165	174	282	294	74	64	172	185	179	161
Sulphate	196	174	149	124	142	152	80	78	261	299	166	169
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.010	0.010	0.013	0.010	0.010	0.009	0.010	0.011	0.010	0.010	0.013	0.009
Zn	0.110	0.120	0.120	0.110	0.140	0.120	0.140	0.120	0.110	0.130	0.120	0.140
Fe	0.120	0.140	0.100	0.120	0.100	0.140	0.120	0.130	0.120	0.140	0.140	0.100
Cd	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

Annexure-XI

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT Apr-2017 to Sep-2017

S. No.	1		2		3		4		5	
Code	E1		G1		I1		K		A	
Months	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17	May-17	Aug-17
pH	7.60	7.70	7.40	7.80	7.70	7.60	7.80	7.60	7.30	7.40
Alkalinity	360.00	321	390	329	542	528	398	362	281	261
Chlorides	278.00	279	161	159	187	180	175	179	221	229
Sulphate	439.00	424.00	612	619	723	721	182	162	279	264
C_2N	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.012	0.010	0.010	0.009	0.013	0.012	0.010	0.011	0.012	0.010
Zn	0.140	0.120	0.140	0.120	0.120	0.130	0.140	0.140	0.100	0.100
Fe	0.140	0.130	0.110	0.110	0.140	0.130	0.130	0.120	0.130	0.120
Cd	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	132	119	138	130	129	121	171	74	129	114
Mg	71	84	82	80	60	63	48	42	69	54

All figures are in mg/l except pH

Walid

Annexure- I (1/3)

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-Oct-17 to March-18

S. No	1		2		3		4		5		6	
Code	GWD		HP-1		WW-16		WW-23		PRK1		KOT-1	
Month	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18
pH	7.70	7.20	7.60	7.10	7.20	7.80	7.80	7.10	7.60	7.90	7.40	7.80
Alkalinity	359	322	242	259	355	349	349	364	424	492	374	354
Chlorides	170	182	192	182	274	271	78	72	196	181	179	169
Sulphate	169	170	144	141	160	172	84	92	275	298	148	124
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.013	0.012	0.012	0.010	0.010	0.010	0.010	0.011	0.011	0.010	0.012	0.010
Zn	0.110	0.120	0.130	0.110	0.130	0.130	0.110	0.140	0.140	0.120	0.100	0.120
Fe	0.120	0.120	0.140	0.130	0.140	0.140	0.140	0.160	0.130	0.110	0.110	0.120
Cd	0.001	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.002	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

Walid

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT Oct-17 to Mar-18

S. No.	1		2		3		4		5	
Code	E1		G1		I1		K		A	
Months	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18
pH	7.90	7.40	7.90	7.50	7.90	7.40	7.40	7.40	7.90	7.60
Alkalinity	349	369	341	372	590	543	342	421	241	288
Chlorides	292	250	145	147	170	163	162	196	242	241
Sulphate	434	478	652	621	810	694	177	142	282	219
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.011	0.014	0.010	0.010	0.012	0.014	0.013	0.011	0.011	0.011
Zn	0.140	0.100	0.140	0.110	0.140	0.120	0.150	0.120	0.140	0.110
Fe	0.130	0.110	0.130	0.130	0.110	0.110	0.100	0.100	0.110	0.130
Cd	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	124	119	139	142	119	142	94	72	126	129
Mg	88	89	85	71	65	78	51	49	59	84

All figures are in mg/l except pH

Walid

Annexure- I (1/3)

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-Oct-17 to March-18

S. No	1		2		3		4		5		6	
Code	GWD		HP-1		WW-16		WW-23		PRK1		KOT-1	
Month	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18
pH	7.70	7.20	7.60	7.10	7.20	7.80	7.80	7.10	7.60	7.90	7.40	7.80
Alkalinity	359	322	242	259	355	349	349	364	424	492	374	354
Chlorides	170	182	192	182	274	271	78	72	196	181	179	169
Sulphate	169	170	144	141	160	172	84	92	275	298	148	124
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.013	0.012	0.012	0.010	0.010	0.010	0.010	0.011	0.011	0.010	0.012	0.010
Zn	0.110	0.120	0.130	0.110	0.130	0.130	0.110	0.140	0.140	0.120	0.100	0.120
Fe	0.120	0.120	0.140	0.130	0.140	0.140	0.140	0.160	0.130	0.110	0.110	0.120
Cd	0.001	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.002	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

Walid

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT Oct-17 to Mar-18

S. No.	1		2		3		4		5	
Code	E1		G1		I1		K		A	
Months	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18	Nov-17	Feb-18
pH	7.90	7.40	7.90	7.50	7.90	7.40	7.40	7.40	7.90	7.60
Alkalinity	349	369	341	372	590	543	342	421	241	288
Chlorides	292	250	145	147	170	163	162	196	242	241
Sulphate	434	478	652	621	810	694	177	142	282	219
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.011	0.014	0.010	0.010	0.012	0.014	0.013	0.011	0.011	0.011
Zn	0.140	0.100	0.140	0.110	0.140	0.120	0.150	0.120	0.140	0.110
Fe	0.130	0.110	0.130	0.130	0.110	0.110	0.100	0.100	0.110	0.130
Cd	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	124	119	139	142	119	142	94	72	126	129
Mg	88	89	85	71	65	78	51	49	59	84

All figures are in mg/l except pH

Walid

Annexure- I (1/3)

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-April-18 to Sep -18

S. No	1		2		3		4		5		6	
Code	GWD		HP-1		WW-16		WW-23		PRK1		KOT-1	
Month	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18
pH	7.90	7.80	7.80	7.60	7.40	7.80	7.40	7.60	7.70	7.40	7.40	7.60
Alkalinity	379	382	241	226	371	369	324	340	405	409	298	371
Chlorides	141	161	174	164	267	270	69	78	172	161	190	180
Sulphate	159	145	152	120	169	159	79	62	189	156	177	182
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.009	0.010	0.011	0.009	0.011	0.010	0.013	0.009	0.012	0.011	0.011	0.010
Zn	0.100	0.110	0.100	0.100	0.100	0.140	0.100	0.120	0.110	0.120	0.140	0.120
Fe	0.140	0.130	0.110	0.110	0.110	0.120	0.140	0.110	0.130	0.130	0.120	0.110
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.002
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED

Annexure I (2/3)

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT April-18 to Sep -18

S. No.	1		2		3		4		5	
Code	E1		G1		I1		K		A	
Months	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18	May-18	Aug-18
pH	7.90	7.80	7.90	7.40	7.60	7.90	7.90	7.60	7.80	7.90
Alkalinity	369	374	392	329	505	546	426	429	259	246
Chlorides	246	226	169	174	174	180	189	176	260	251
Sulphate	466	416	599	578	655	619	156	146	240	244
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.011	0.010	0.013	0.010	0.012	0.010	0.012	0.010	0.010	0.011
Zn	0.140	0.120	0.110	0.140	0.130	0.120	0.130	0.110	0.140	0.012
Fe	0.100	0.130	0.140	0.120	0.100	0.110	0.140	0.120	0.130	0.100
Cd	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.001	0.002
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	129	120	149	142	149	149	78	79	141	139
Mg	79	80	72	74	84	76	51	49	79	40

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-October-18 to March-19

S. No	1		2		3		4		5		6	
Code	GWD		HP-1		WW-16		WW-23		PRK1		KOT-1	
Month	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19
pH	7.40	7.90	7.90	7.40	7.60	7.40	7.40	7.20	7.90	7.40	7.90	7.40
Alkalinity	342	374	276	280	378	391	347	374	419	420	398	347
Chlorides	167	174	159	140	292	241	87	74	197	220	171	190
Sulphate	150	169	135	118	171	160	56	65	169	179	194	140
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.014	0.009	0.014	0.010	0.011	0.009	0.012	0.009	0.013	0.009	0.011	0.090
Zn	0.130	0.100	0.110	0.110	0.120	0.008	0.110	0.100	0.140	0.080	0.120	0.100
Fe	0.120	0.009	0.140	0.120	0.130	0.009	0.130	0.090	0.090	0.100	0.100	0.110
Cd	0.002	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.002	0.002	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

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HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT October -18 to March-19

Annexure I (2/3)

S. No.	1		2		3		4		5	
Code	E1		G1		I1		K		A	
Months	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19	Nov-18	Feb-19
pH	7.40	7.20	7.90	7.40	7.60	7.90	7.40	7.90	7.40	7.80
Alkalinity	398	347	381	420	519	671	451	459	276	296
Chlorides	247	274	169	178	161	141	181	189	249	260
Sulphate	431	439	601	566	620	549	169	174	264	279
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.011	0.010	0.011	0.009	0.011	0.009	0.010	0.009	0.010	0.009
Zn	0.120	0.100	0.130	0.100	0.130	0.100	0.120	0.100	0.140	0.100
Fe	0.100	0.090	0.110	0.080	0.140	0.100	0.110	0.090	0.120	0.090
Cd	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.002
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	121	108	131	140	141	140	65	49	121	129
Mg	60	70	71	69	70	62	42	51	69	74

All figures are in mg/l except pH

Annexure- I (1/3)

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-Oct-19 to Mar-2020

S. No	1		2		3		4		5		6		7		8		9		10		11	
Code	WW-10		ww-22		GWD		WW-13		HP-1		WW-15		WW-16		WW-23		PRK-1		KOT-1		WW-14	
Month	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	7.80	7.90	7.80	7.80	7.90	8.00	7.80	8.20	7.60	8.10	7.80	8.10	7.90	8.40	7.40	7.90	7.40	8.10	7.90	8.20	7.10	7.40
Alkalinity	396	410	264	310	354	370	260	190	252	270	347	396	341	321	369	376	290	310	370	340	340	390
Chlorides	56	62	62	51	150	159	55	62	102	99	63	54	222	179	72	62	181	191	168	157	74	60
Sulphate	310	396	60	89	181	120	167	121	96	103	74	69	142	106	60	51	194	174	198	169	88	81
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.008	0.008	0.007	0.006	0.008	0.007	0.007	0.005	0.008	0.007	0.008	0.008	0.009	0.007	0.009	0.008	0.006	0.006	0.007	0.008	0.007	0.007
Zn	0.090	0.100	0.070	0.080	0.100	0.100	0.090	0.080	0.100	0.090	0.070	0.080	0.100	0.110	0.090	0.110	0.080	0.080	0.110	0.100	0.090	0.080
Fe	0.080	0.070	0.070	0.080	0.110	0.090	0.110	0.090	0.070	0.080	0.090	0.100	0.110	0.120	0.090	0.100	0.090	0.100	0.100	0.120	0.110	0.100
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED **Annexure I (2/3)**

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT October -19 to March-2020

S. No.	1		2		3		4		5		6		7		8	
Code	P		H		E1		G1		I1		K1		A		Adm	
Months	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	7.40	7.80	7.60	7.80	7.60	7.90	7.60	7.90	7.40	8.00	7.40	7.90	7.60	8.10	7.90	7.80
Alkalinity	314	319	342	301	310	348	421	370	555	590	420	410	260	239	390	370
Chlorides	147	171	160	151	191	204	168	187	139	170	160	171	201	240	162	145
Sulphate	102	119	372	351	360	378	490	460	430	410	146	135	207	213	410	492
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.007	0.007	0.009	0.008	0.009	0.008	0.009	0.007	0.008	0.007	0.008	0.007	0.009	0.008	0.010	0.009
Zn	0.100	0.100	0.100	0.110	0.080	0.070	0.070	0.090	0.090	0.090	0.100	0.090	0.090	0.100	0.090	0.100
Fe	0.090	0.100	0.070	0.080	0.100	0.100	0.090	0.100	0.070	0.080	0.100	0.080	0.070	0.080	0.100	0.110
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	81	78	72	81	97	101	88	70	72	60	31	37	81	70	60	57
Mg	30	34	34	30	37	40	40	33	41	39	40	31	52	40	38	33

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-April-2020 to Sep-2020

S. No	1		2		3		4		5		6		7		8		9		10		11	
Code	WW-10		ww-22		GWD		WW-13		HP-1		WW-15		WW-16		WW-23		PRK-1		KOT-1		WW-14	
Month	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20
pH	7.60	7.60	7.60	7.40	7.80	8.10	8.00	8.20	8.10	7.90	7.60	7.80	8.60	7.80	7.20	7.90	8.00	8.20	7.40	7.80	7.80	7.40
Alkalinity	420	390	320	239	394	384	210	301	270	295	349	421	340	346	347	340	340	331	324	347	374	351
Chlorides	69	64	68	54	162	170	69	65	99	78	59	53	192	152	78	56	174	165	162	189	67	56
Sulphate	413	320	72	69	129	165	139	170	103	120	72	86	162	192	62	69	189	130	142	174	89	72
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.008	0.007	0.007	0.007	0.008	0.008	0.006	0.005	0.007	0.008	0.007	0.008	0.008	0.009	0.007	0.009	0.007	0.007	0.007	0.006	0.008	0.007
Zn	0.090	0.080	0.100	0.090	0.080	0.090	0.070	0.090	0.090	0.100	0.090	0.070	0.120	0.100	0.090	0.070	0.090	0.050	0.100	0.110	0.080	0.090
Fe	0.070	0.070	0.090	0.080	0.100	0.110	0.100	0.100	0.080	0.070	0.110	0.100	0.110	0.090	0.110	0.100	0.100	0.080	0.008	0.070	0.100	0.090
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

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HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT April-2020 to Sep-2020

S. No.	1		2		3		4		5		6		7		8	
Code	P		H		E1		G1		I1		K		A		Adm	
Months	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20	May-20	Sep-20
pH	7.60	7.50	7.40	7.6	7.40	7.60	7.40	8.10	7.50	7.20	7.60	7.40	7.80	7.40	7.40	7.30
Alkalinity	267	271	322	347	376	369	422	401	545	521	485	420	270	247	430	401
Chlorides	162	169	162	150	230	204	166	151	142	139	188	169	255	197	167	176
Sulphate	130	121	390	249	413	401	540	512	439	451	167	174	279	289	430	473
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.009	0.009	0.009	0.008	0.009	0.009	0.009	0.008	0.009	0.010	0.010	0.009	0.007	0.007	0.008	0.009
Zn	0.090	0.100	0.100	0.100	0.080	0.120	0.100	0.100	0.080	0.080	0.120	0.070	0.100	0.080	0.110	0.100
Fe	0.110	0.110	0.070	0.080	0.100	0.110	0.110	0.120	0.100	0.080	0.110	0.080	0.090	0.100	0.100	0.110
Cd	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	68	69	65	59	94	81	64	61	65	68	45	47	62	54	70	61
Mg	37	39	32	38	38	34	30	34	34	36	29	35	45	40	40	32

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-October-2020 to March 2021

Annexure- I (1/3)

S. No	1		2		3		4		5		6		7		8		9		10		11	
Code	WW-10		ww-22		GWD		WW-13		HP-1		WW-15		WW-16		WW-23		PRK-1		KOT-1		WW-14	
Month	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021	Nov-2020	Feb-2021
pH	7.3	7.9	7.3	7.5	7.2	7.6	7.7	7.8	7.4	7.6	7.5	7.8	7.5	7.4	7.8	7.4	7.5	7.4	7.4	7.7	7.7	7.40
Alkalinity	346	369	288	268	304	324	280	241	301	341	401	392	305	314	370	347	378	381	398	347	380	387
Chlorides	54	60	61	52	158	171	60	69	69	74	80	78	142	121	80	79	180	162	169	172	60	70
Sulphate	290	320	85	79	140	151	150	145	126	146	71	87	150	139	61	67	210	187	208	213	74	87
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.006	0.007	0.009	0.008	0.009	0.008	0.009	0.008	0.007	0.007	0.006	0.007	0.008	0.009	0.008	0.007	0.009	0.008	0.007	0.007	0.006	0.008
Zn	0.080	0.080	0.110	0.100	0.120	0.130	0.080	0.100	0.110	0.100	0.080	0.080	0.110	0.120	0.110	0.110	0.140	0.120	0.110	0.110	0.120	0.110
Fe	0.090	0.100	0.090	0.070	0.130	0.110	0.110	0.120	0.090	0.100	0.100	0.110	0.100	0.100	0.120	0.100	0.120	0.100	0.140	0.120	0.080	0.120
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

HINDUSTAN ZINC LIMITED **Annexure I (2/3)**

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT October 2020 to March 2021

S. No.	1		2		3		4		5		6		7		8	
Code	P		H		E1		G1		I1		K		A		Adm	
Months	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21	Nov-20	Feb-21
pH	7.70	7.40	7.80	7.60	7.50	7.40	7.60	7.70	7.40	7.60	7.60	7.60	7.60	7.80	7.60	7.50
Alkalinity	306	376	356	340	388	347	376	398	510	524	440	474	250	241	399	347
Chlorides	174	187	166	165	189	198	162	174	151	170	176	156	188	176	182	199
Sulphate	140	157	306	348	376	374	469	421	308	347	190	210	301	329	406	409
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.009	0.008	0.009	0.008	0.009	0.009	0.007	0.009	0.011	0.010	0.009	0.009	0.008	0.007	0.009	0.007
Zn	0.110	0.100	0.110	0.100	0.140	0.140	0.110	0.130	0.090	0.120	0.080	0.090	0.090	0.100	0.110	0.120
Fe	0.140	0.130	0.090	0.110	0.100	0.110	0.130	0.140	0.080	0.100	0.080	0.100	0.110	0.090	0.140	0.100
Cd	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	77	70	76	59	78	71	64	70	70	59	50	45	60	51	70	60
Mg	48	38	39	34	30	40	40	31	38	33	37	26	38	30	42	45

All figures are in mg/l except pH

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Annexure-XII

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **1006**
Report On : **10/11/2014**

I hereby certify that I **R P Verma**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well Near Adm. Building** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	NIL
2	Phosphate as PO_4 mg/l	0.3
3	pH	7.87
4	Chemical Oxygen Demand (COD) mg/l	22.32
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	1.45
6	Chloride as Cl mg/l	568
7	Sulphate as SO_4 mg/l	475
8	Hardness (Total) as $CaCO_3$ mg/l	540
9	Hardness (Calcium) as $CaCO_3$ mg/l	280
10	Magnesium Hardness as $CaCO_3$ mg/l	60
11	Ammonical Nitrogen as N mg/l	0.54
12	Fluoride as F mg/l	0.56
13	Total Dissolved Solids mg/l	2350
14	Conductivity at 25° C µmho/cm_2	3400
15	Total Alkalinity as $CaCO_3$ mg/l	232
16	Turbidity NTU	8.5
17	Boron as B mg/l	0.60
18	Dissolved Oxygen mg/l	4.40
19	Nitrate as NO_3 mg/l	4.82

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

Attested Copy
लोक सूचना अधिकारी
राज. रा. प्र. नि. म.
क्षे का. कोटा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)

Final Report

Report No. : **1007**
Report On : **10/11/2014**

I hereby certify that **I R P Verma**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well No. P (Near Primary Crusher)** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	NIL
2	Phosphate as PO_4 mg/l	0.2
3	pH	8.1
4	Chemical Oxygen Demand (COD) mg/l	14.4
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	1.29
6	Chloride as Cl mg/l	664
7	Sulphate as SO_4 mg/l	52
8	Hardness (Total) as $CaCO_3$ mg/l	560
9	Hardness (Calcium) as $CaCO_3$ mg/l	480
10	Magnesium Hardness as $CaCO_3$ mg/l	80
11	Ammonical Nitrogen as N mg/l	0.68
12	Fluoride as F mg/l	1.16
13	Total Dissolved Solids mg/l	2130
14	Conductivity at 25° C µmho/cm_2	3900
15	Total Alkalinity as $CaCO_3$ mg/l	156
16	Turbidity NTU	9.5
17	Boron as B mg/l	0.42
18	Dissolved Oxygen mg/l	4.48
19	Nitrate as NO_3 mg/l	43.41

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

Attested Copy
लोक सूचना अधिकारी
राज. रा. प्र. नि. म.
क्षे का. कोटा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **1011**
Report On : **10/11/2014**

I hereby certify that I **R P Verma**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well No. H-1 (Before I.B.P)** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	NIL
2	Phosphate as PO_4 mg/l	0.1
3	pH	7.6
4	Chemical Oxygen Demand (COD) mg/l	33.12
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	4.2
6	Chloride as Cl mg/l	968
7	Sulphate as SO_4 mg/l	255
8	Hardness (Total) as $CaCO_3$ mg/l	528
9	Hardness (Calcium) as $CaCO_3$ mg/l	360
10	Magnesium Hardness as $CaCO_3$ mg/l	168
11	Ammonical Nitrogen as N mg/l	0.68
12	Fluoride as F mg/l	0.8
13	Total Dissolved Solids mg/l	2220
14	Conductivity at 25° C µmho/cm_2	4800
15	Total Alkalinity as $CaCO_3$ mg/l	36
16	Turbidity NTU	6.2
17	Boron as B mg/l	0.27
18	Dissolved Oxygen mg/l	4.4
19	Nitrate as NO_3 mg/l	8.06

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

Attested Copy
लोक सूचना अधिकारी
राज. रा. प्र. नि. म.
क्षे का. कोटा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **1008**
Report On : **10/11/2014**

I hereby certify that I **R P Verma**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water of M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well No. K (Near Mine Pit Boundary)** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	12
2	Phosphate as PO_4 mg/l	0.2
3	pH	8.34
4	Chemical Oxygen Demand (COD) mg/l	6.48
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	1.66
6	Chloride as Cl mg/l	468
7	Sulphate as SO_4 mg/l	105
8	Hardness (Total) as $CaCO_3$ mg/l	290
9	Hardness (Calcium) as $CaCO_3$ mg/l	150
10	Magnesium Hardness as $CaCO_3$ mg/l	140
11	Ammonical Nitrogen as N mg/l	0.58
12	Fluoride as F mg/l	1.42
13	Total Dissolved Solids mg/l	2186
14	Conductivity at 25° C µmho/cm_2	3200
15	Total Alkalinity as $CaCO_3$ mg/l	180
16	Turbidity NTU	0.7
17	Boron as B mg/l	0.48
18	Dissolved Oxygen mg/l	4.81
19	Nitrate as NO_3 mg/l	13.95

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

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राज. रा. प्र. नि. म.
क्षे. का. कोटा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **1009**
Report On : **10/11/2014**

I hereby certify that I **R P Verma**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well No. A (Near Bherukheda village opening)** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	16
2	Phosphate as PO_4 mg/l	0.3
3	pH	8.31
4	Chemical Oxygen Demand (COD) mg/l	34.56
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	1.33
6	Chloride as Cl mg/l	880
7	Sulphate as SO_4 mg/l	162.5
8	Hardness (Total) as $CaCO_3$ mg/l	650
9	Hardness (Calcium) as $CaCO_3$ mg/l	170
10	Magnesium Hardness as $CaCO_3$ mg/l	480
11	Ammonical Nitrogen as N mg/l	0.72
12	Fluoride as F mg/l	0.96
13	Total Dissolved Solids mg/l	2662
14	Conductivity at 25° C µmho/cm_2	4200
15	Total Alkalinity as $CaCO_3$ mg/l	136
16	Turbidity NTU	0.5
17	Boron as B mg/l	0.56
18	Dissolved Oxygen mg/l	4.48
19	Nitrate as NO_3 mg/l	31.18

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

4/7

लोक सूचना अधिकारी
राज. रा. प्र. नि. म.
क्षे का. कोटा

(4)

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **1010**
Report On : **10/11/2014**

I hereby certify that I R P Verma, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **03/11/2014** from **Shri Ashok Kumar Jeliya, JEE, Bhilwara ,RSPCB Bhilwara & Shri M. C. Soni, Lab Assistant, Kota ,RSPCB Kota** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer Well No. I-1 (Near Reclaim water pump house)** Collected on **31/10/2014**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **10/11/2014** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Phenopthalin Alkalinity mg/l	12
2	Phosphate as PO_4 mg/l	0.2
3	pH	8.48
4	Chemical Oxygen Demand (COD) mg/l	37.44
5	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	4.52
6	Chloride as Cl mg/l	944
7	Sulphate as SO_4 mg/l	305
8	Hardness (Total) as $CaCO_3$ mg/l	320
9	Hardness (Calcium) as $CaCO_3$ mg/l	110
10	Magnesium Hardness as $CaCO_3$ mg/l	210
11	Ammonical Nitrogen as N mg/l	0.94
12	Fluoride as F mg/l	0.76
13	Total Dissolved Solids mg/l	3944
14	Conductivity at 25° C µmho/cm_2	6100
15	Total Alkalinity as $CaCO_3$ mg/l	292
16	Turbidity NTU	3.4
17	Boron as B mg/l	1.1
18	Dissolved Oxygen mg/l	4.57
19	Nitrate as NO_3 mg/l	12.40

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **10/11/2014**

BOARD ANALYST
Rajasthan State Pollution Control Board
Regional Office Kota
SPL-2A, Road no. 6, Indrapasth Ind. Area, Kota
Phone: 0744-2490873

4/7

Attested Copy
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राज. रा. प्र. नि. म.
क्षे का. कोटा

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **15338**
Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well- ADM, Near Admin Block** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.01
2	Chemical Oxygen Demand (COD) mg/l	3.6
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	0.141
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.065
8	Iron as Fe mg/l	0.275
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	408
11	Sulphate as SO_4 mg/l	1302
12	Calcium (Titrimetric) as Ca mg/l	131
13	Magnesium as Mg mg/l	79
14	Total Alkalinity as $CaCO_3$ mg/l	220

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)

Final Report

Report No. : **15337**

Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water of M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District-Bhilwara M.L No- 1/2000** Collected from **Piezometer well-P, Near Central Work Shop** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.02
2	Chemical Oxygen Demand (COD) mg/l	24
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	1.5
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	0.183
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.075
8	Iron as Fe mg/l	0.630
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	480
11	Sulphate as SO_4 mg/l	1269
12	Calcium (Titrimetric) as Ca mg/l	147
13	Magnesium as Mg mg/l	54
14	Total Alkalinity as $CaCO_3$ mg/l	276

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **15339**
Report On : **26/05/2017**

I hereby certify that I **B R Chauhan,** State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well-H, Before IBP** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.97
2	Chemical Oxygen Demand (COD) mg/l	7.5
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	0.5
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	0.275
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.047
8	Iron as Fe mg/l	0.862
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	160
11	Sulphate as SO_4 mg/l	198
12	Calcium (Titrimetric) as Ca mg/l	58
13	Magnesium as Mg mg/l	36
14	Total Alkalinity as $CaCO_3$ mg/l	228

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **15340**
Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well -K, CISF Colony** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.24
2	Chemical Oxygen Demand (COD) mg/l	4.9
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	0.2
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	1.19
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.046
8	Iron as Fe mg/l	0.476
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	136
11	Sulphate as SO_4 mg/l	178
12	Calcium (Titrimetric) as Ca mg/l	38
13	Magnesium as Mg mg/l	37
14	Total Alkalinity as $CaCO_3$ mg/l	224

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
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Report No. : **15341**
Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well-A, Near Material Gate** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.21
2	Chemical Oxygen Demand (COD) mg/l	4.3
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	0.193
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.04
8	Iron as Fe mg/l	0.168
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	292
11	Sulphate as SO_4 mg/l	779
12	Calcium (Titrimetric) as Ca mg/l	70
13	Magnesium as Mg mg/l	60
14	Total Alkalinity as $CaCO_3$ mg/l	216

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)

Final Report

Report No. : **15342**

Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well -EI, Behind New Pump House** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.10
2	Chemical Oxygen Demand (COD) mg/l	9.9
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	0.5
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	1.04
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.072
8	Iron as Fe mg/l	4.73
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	536
11	Sulphate as SO_4 mg/l	1656
12	Calcium (Titrimetric) as Ca mg/l	106
13	Magnesium as Mg mg/l	92
14	Total Alkalinity as $CaCO_3$ mg/l	220

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **26/05/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
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FORM - X
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Report No. : **15343**
Report On : **26/05/2017**

I hereby certify that I **B R Chauhan**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **17/02/2017** from **Dr Giriraj Kumar Songara, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Piezometer well -II, Near Old Pumping Station** Collected on **15/02/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **26/05/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.09
2	Chemical Oxygen Demand (COD) mg/l	6.4
3	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	0.25
4	Copper as Cu mg/l	Not Traceable
5	Zinc as Zn mg/l	1.16
6	Nickel as Ni mg/l	Not Traceable
7	Lead as Pb mg/l	0.062
8	Iron as Fe mg/l	0.450
9	Cadmium as Cd mg/l	Not Traceable
10	Chloride as Cl mg/l	272
11	Sulphate as SO_4 mg/l	1385
12	Calcium (Titrimetric) as Ca mg/l	107
13	Magnesium as Mg mg/l	54
14	Total Alkalinity as $CaCO_3$ mg/l	240

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **26/05/2017**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
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FORM - X
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Final Report

Report No. : **20145**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer E-1 behind new pump house.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.20
2	Total Suspended Solids mg l	4
3	Chemical Oxygen Demand (COD) mg/l	2.5
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.025
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.210
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	232
13	Sulphate as SO_4 mg/l	230
14	Hardness (Total) as $CaCO_3$ mg/l	916
15	Hardness (Calcium) as $CaCO_3$ mg/l	84
16	Magnesium Hardness as $CaCO_3$ mg/l	832
17	Calcium (Titrimetric) as Ca mg/l	34
18	Magnesium as Mg mg/l	203
19	Fluoride as F mg/l	0.524
20	Total Alkalinity as $CaCO_3$ mg/l	280

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
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REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20146**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer I-1 near reclaim water pump house.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	[illegible]
2	Total Suspended Solids mg/l	11
3	Chemical Oxygen Demand (COD) mg/l	3.3
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.136
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.393
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	272
13	Sulphate as SO_4 mg/l	338
14	Hardness (Total) as $CaCO_3$ mg/l	656
15	Hardness (Calcium) as $CaCO_3$ mg/l	124
16	Magnesium Hardness as $CaCO_3$ mg/l	532
17	Calcium (Titrimetric) as Ca mg/l	50
18	Magnesium as Mg mg/l	130
19	Fluoride as F mg/l	0.478
20	Total Alkalinity as $CaCO_3$ mg/l	272

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
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(See Rule - 24)
Final Report

Report No. : **20147**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer G-1 near Papri Kheda Village (downstream of Tailing Dam)** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	**pH**	7.9
2	Total Suspended Solids mg/l	10
3	Chemical Oxygen Demand (COD) mg/l	7
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.049
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.213
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	248
13	Sulphate as SO_4 mg/l	290
14	Hardness (Total) as $CaCO_3$ mg/l	500
15	Hardness (Calcium) as $CaCO_3$ mg/l	120
16	Magnesium Hardness as $CaCO_3$ mg/l	380
17	Calcium (Titrimetric) as Ca mg/l	48
18	Magnesium as Mg mg/l	93
19	Fluoride as F mg/l	0.481
20	Total Alkalinity as $CaCO_3$ mg/l	252

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
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(See Rule - 24)
Final Report

Report No. : **20148**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Tailing Dam Water.** Collected on **28/12/2020.** The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	[illegible]
2	Total Suspended Solids mg/l	36
3	Chemical Oxygen Demand (COD) mg/l	8.2
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	2.94
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.297
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	1480
13	Sulphate as SO_4 mg/l	1400
14	Hardness (Total) as $CaCO_3$ mg/l	2024
15	Hardness (Calcium) as $CaCO_3$ mg/l	1316
16	Magnesium Hardness as $CaCO_3$ mg/l	708
17	Calcium (Titrimetric) as Ca mg/l	526
18	Magnesium as Mg mg/l	173
19	Fluoride as F mg/l	0.578
20	Total Alkalinity as $CaCO_3$ mg/l	116

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
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Report No. : **20149**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer ADM near Admin Block.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.9
2	Total Suspended Solids mg/l	12
3	Chemical Oxygen Demand (COD) mg/l	2.9
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.253
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.404
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	164
13	Sulphate as SO_4 mg/l	376
14	Hardness (Total) as $CaCO_3$ mg/l	604
15	Hardness (Calcium) as $CaCO_3$ mg/l	260
16	Magnesium Hardness as $CaCO_3$ mg/l	344
17	Calcium (Titrimetric) as Ca mg/l	104
18	Magnesium as Mg mg/l	84
19	Fluoride as F mg/l	0.62
20	Total Alkalinity as $CaCO_3$ mg/l	284

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20150**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer P near Central Workshop.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	- [illegible]
2	Total Suspended Solids mg/l	10
3	Chemical Oxygen Demand (COD) mg/l	4.2
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.089
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.44
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	284
13	Sulphate as SO_4 mg/l	534
14	Hardness (Total) as $CaCO_3$ mg/l	572
15	Hardness (Calcium) as $CaCO_3$ mg/l	108
16	Magnesium Hardness as $CaCO_3$ mg/l	464
17	Calcium (Titrimetric) as Ca mg/l	43
18	Magnesium as Mg mg/l	113
19	Fluoride as F mg/l	0.449
20	Total Alkalinity as $CaCO_3$ mg/l	280

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20151**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory & Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer H near Tailing Dam.(before IBP)** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	8.01
2	Total Suspended Solids mg/l	6
3	Chemical Oxygen Demand (COD) mg/l	2.1
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.056
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.412
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	288
13	Sulphate as SO_4 mg/l	314
14	Hardness (Total) as $CaCO_3$ mg/l	744
15	Hardness (Calcium) as $CaCO_3$ mg/l	84
16	Magnesium Hardness as $CaCO_3$ mg/l	660
17	Calcium (Titrimetric) as Ca mg/l	34
18	Magnesium as Mg mg/l	161
19	Fluoride as F mg/l	0.549
20	Total Alkalinity as $CaCO_3$ mg/l	256

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
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(See Rule - 24)
Final Report

Report No. : **20152**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer K CISF Colony.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	**pH**	7.90
2	Total Suspended Solids mg/l	3
3	Chemical Oxygen Demand (COD) mg/l	4.6
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.24
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	2.36
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	184
13	Sulphate as SO_4 mg/l	251
14	Hardness (Total) as $CaCO_3$ mg/l	464
15	Hardness (Calcium) as $CaCO_3$ mg/l	76
16	Magnesium Hardness as $CaCO_3$ mg/l	388
17	Calcium (Titrimetric) as Ca mg/l	30
18	Magnesium as Mg mg/l	95
19	Fluoride as F mg/l	0.547
20	Total Alkalinity as $CaCO_3$ mg/l	688

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20153**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Water** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Sample of Pizometer A near Material Gate.** Collected on **28/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	**pH**	7.81
2	Total Suspended Solids mg/l	7
3	Chemical Oxygen Demand (COD) mg/l	2.5
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	Not Traceable
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.147
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	260
13	Sulphate as SO_4 mg/l	359
14	Hardness (Total) as $CaCO_3$ mg/l	1392
15	Hardness (Calcium) as $CaCO_3$ mg/l	152
16	Magnesium Hardness as $CaCO_3$ mg/l	1240
17	Calcium (Titrimetric) as Ca mg/l	61
18	Magnesium as Mg mg/l	303
19	Fluoride as F mg/l	0.545
20	Total Alkalinity as $CaCO_3$ mg/l	268

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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Fax: 0141-5159665

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20154**
Report On : **01/02/2021**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **04/01/2021** from **Dr. Narain Bhoot, SO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Water** of **M S Hindustan Zinc Limited , Plant - , , Tehsil- Railmagra , District- Rajsamand** Collected from **Sample of Pizometer behind lead RMH** Collected on **30/12/2020**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **01/02/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.31
2	Total Suspended Solids mg/l	Nil
3	Chemical Oxygen Demand (COD) mg/l	6.2
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	Not Traceable
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.024
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	1.0
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	176
13	Sulphate as SO_4 mg/l	465
14	Hardness (Total) as $CaCO_3$ mg/l	576
15	Hardness (Calcium) as $CaCO_3$ mg/l	120
16	Magnesium Hardness as $CaCO_3$ mg/l	456
17	Calcium (Titrimetric) as Ca mg/l	48
18	Magnesium as Mg mg/l	111
19	Fluoride as F mg/l	0.334
20	Total Alkalinity as $CaCO_3$ mg/l	248

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **01/02/2021**

BOARD ANALYST

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Assessment of Aquifer Vulnerability at Rampura-Agucha Mine of Hindustan Zinc Limited

Sponsor

Rampura-Agucha Mine, Hindustan Zinc Ltd.

CSIR-National Environmental Engineering Research Institute
Nehru Marg, Nagpur - 440020

NEERI

May 2016

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Acknowledgements

CSIR-National Environmental Engineering Research Institute, Nagpur grateful to the management of Rampura-Agucha Mine, Hindustan Zinc Ltd. for sponsoring the study. The technical co-operation and logistic support extended by HZL during various stages of the study is gratefully acknowledged.

Amit Bansiwal
(Project Leader)

M.P. Patil
(Project Coordinator)

A.N. Vaidya
(Project Coordinator)

Project Team

Dr. A. Vaidya	- Project Coordinator
Dr. M.P. Patil	- Project Coordinator
Dr. Amit Bansiwal	- Project Leader
Mr. Akhil Khedulkar	- Project Assistant
Ms. Minal Suryawanshi	- Project Assistant
Ms. Sachi Sule	- Project Assistant

1.0 Introduction

1.1 Background

Hindustan Zinc Limited (HZL) is the only integrated Zinc manufacturer in India and owns captive Zinc mines that supply complete requirement of Zinc concentrate for its smelters. HZL operates mechanized open cast and underground mining with state of the art technology at Rampura Agucha Mine in the Bhilwara district of Rajasthan. The mine is located at a distance of 200 km from State capital Jaipur and 225 km from Udaipur. Rampura Agucha Mine (RA Mine) is an ISO 9001, ISO 14001, OHSAS 18001 & SA-8000 certified unit with a lease area of 1200 ha. The RA Mine was commissioned in the year of 1991. RA Mine excavates and produces zinc–lead ores by mining and mineral processing operations. The mining and mineral processing operations include blasting, transportation, crushing, grinding, screening, and ore beneficiation (floatation, thickening, and pressure filtration). The present capacity is 6.15 million metric tons per annum (MMTPA) of ore production and 6.5 MMTPA of ore beneficiation plant to produce zinc and lead concentrates of 53-54% and 60-65% respectively.

Major mining infrastructure in the RA Mines are open pit of approx. 175 ha, tailing dam in 190 ha, infrastructure in 90 ha and waste dump in 300 ha. It has four stream of beneficiation plants. Concurrent mining by opencast and underground are under operation at the location.

During beneficiation of ores, large quantity of tailings amounting to 5 million metric tonnes per annum (MMTPA) are generated. The tailings are transported in a slurry form beneficiation plants through closed pipelines to a confined area known as "**Tailing Dam**" which is located 800 m away from the ore beneficiation plant. The tailing dam is constructed with the mine over-burden and soil. The tailings in the slurry form are discharged to the tailing dam wherein the solids settled at the bottom of the tailing dam and the supernatant (water) is pumped back to the beneficiation plant for reuse. Due to the increase

in the quantity of tailings and to accommodate present as well as future generation of tailings, HZL propose to increase the height of tailing dam up to 74 m.

Keeping in view the large quantities of tailings disposed off in the tailing dam, the possibility of seepage of water from the tailing dam and contamination of underlying aquifer (groundwater) in the area, HZL desired to get a study done on the assessment of aquifer vulnerability of the Rampura-Agucha mining area. HZL retained CSIR-National Environmental Engineering Research Institute (NEERI), Nagpur in October 2015 to undertake this study.

1.2 Objectives & Scope of Work

The main objective of the study is to assess the impact of tailing dam on groundwater through aquifer vulnerability study.

Scope of Work Include:

i) Reconnaissance survey of the RA Mine with respect to products, process, raw materials, and tailing management

ii) Assessment of present status of tailing disposal at RA Mine

iii) Sampling and characterization of tailings and recycled water for various physico-chemical parameters

iv) Assessment of leaching potential of tailings as per Indian and international standards.

v) Collection and compilation of geological and hydrogeological data for tailing disposal site of RA Mine.

vi) Assessment of aquifer vulnerability of RA Mine using appropriate modeling tools

vii) Validation of model results through monitoring of groundwater quality around tailing dam.

1.3 Methodology

CSIR-NEERI had already carried out similar study on aquifer vulnerability at Rampura-Agucha Mine in 2006. The aquifer vulnerability study was carried out using an empirical hydrogeologic model namely "DRASTIC" developed by United States Environment Protection Agency (USEPA), followed by validation of model output through monitoring of groundwater in the area.

Since a considerable time has elapsed, quantities of tailings have significantly increased and the proposed increase of the height of tailing dam to 74 m, HZL desires to reassess the aquifer vulnerability. Based on the preliminary discussions, it was agreed upon between HZL and CSIR-NEERI that same methodology as used 2006 NEERI Report would be followed during the present aquifer vulnerability study. Accordingly, keeping in view the above objective and scope of work, filed studies were undertaken in the month of November 2015. During the field studies relevant data/information on prevailing mining and ore processing operations, tailing disposal, geology & hydrogeology of the area was collected from RA Mine. Based on the understanding of regional geology and hydrogeology of the Mine lease and surrounding area, number of groundwater samples from the existing dug wells, bore wells, hand pumps were also collected in and around the mine lease area.

The geological and hydrogeological data collected from RA Mine was used for calculating Aquifer Vulnerability Index (AVI) during the present study. The groundwater monitoring data was used for validation of AVI. The details on these aspects are presented in the present report.

2.0 Project Setting

2.1 Present Status of Tailing Dam at RA Mine

Based on the site reconnaissance in and around RA Mine and discussions with officials of RA Mine, the most potential threat to groundwater in the area was identified as tailing dam where the large quantities of tailings alongwith the process water are disposed off. Thus the present study is aimed at determining the aquifer pollution potential index and the degrees of vulnerability due to the existing tailing dam at RA Mine of HZL.

As stated earlier, RA Mine excavates 6.15 million metric tonnes per annum (MMTPA) and beneficiates 6.5 MMTPA of lead-zinc ore collectively from other mines to produce zinc and lead concentrates of 53-54% and 60-65% respectively. During the ore beneficiation operations, RAM generates about 5 MMTPA of tailings. The tailings are pumped from the tailing batteries and transported through pipelines in a slurry form to a confined area known as "Tailing Dam". The Tailing Dam is located at a distance of about 800 m from the ore beneficiation plant. The tailings in the slurry form are discharged to the tailing dam through closed pipelines, wherein the solids settle at the bottom of the tailing dam and the supernatant (water) is recycled back to the beneficiation plant. About 50-60 % water from the tailings discharge is recycled back from the tailing dam to the ore beneficiation plant.

The tailings dam has bunds constructed all-around on fairly level ground adjacent to the mine pit. The tailing dam encompasses about 1 sq-km area. The bund raising has been done by using mine overburden and soil. The tailing dam has been constructed in phases. Bund rising in each phase is about 6m. At present the bund rising has been completed up to a height of 51 m (Phase VII) which is expected to be completed by June 2016. It is proposed to raise the height of tailing dam up to 74 m in total XII phases. In all the seven phases of rising, the overburden has been dumped generally to a slope 1:2 both upstream (U/S) and downstream (D/S). A very large top width of 25 to 30m has been

provided for the movement of mine machinery/vehicles during construction. In the initial years during phase I construction, the U/S slope of 1V:1.5H and the D/S slope 1 V :2H was used. However, during phase II and , phase III construction of the bunds, the slope of IV:2H was uniformly used for U/S and D/S slopes. During the phase I construction, 0.4 m thick impervious layer was provided, on bottom as well as upstream slope. However, during subsequent Phases, impervious clay layer of 1 m to 2 m was used on upstream slope. During construction of Phase II onwards, a five layer system was adopted on the upstream slopes. The five layers include soil, sand, HDPE, stone aggregate and stone pitching.

During site reconnaissance, it was observed that the bund has been experiencing seepage on the north and the northwest corner of the tailing dam. The same seepage was also reported by NEERI during the previous study in 2006. It may therefore be inferred that the seepage is taking place from the tailing dam for a long time. The probable reason for the seepage could be the use of thin layer of clay at the bottom of tailing dam during Phase I construction. Since, HZL has used HDPE liners on the upstream slopes of the bunds and thicker layers of clay during subsequent Phases of tailing dam construction, the seepage of water has been controlled to a larger extent. The estimated average quantity of, seepage water is about 50 to 60 m^3 per hour through the bunds including the seasonal variations. RA Mine has taken adequate control measures to channelize the seepage water by providing a lined canal of 900 m length and lined collection sumps of 1.2 lakh m^3 with adequate pumping capacity at a approx. cost of Rs. 600 La. The seepage collected through these channels and sumps is recycled back to the plant.

Fig. 1 depicts the surface plan of RA Mine of HZL. **Fig. 2** depicts the plan view of the tailing Dam. The present status of Tailing Dam is depicted in Plate 1 to 4.

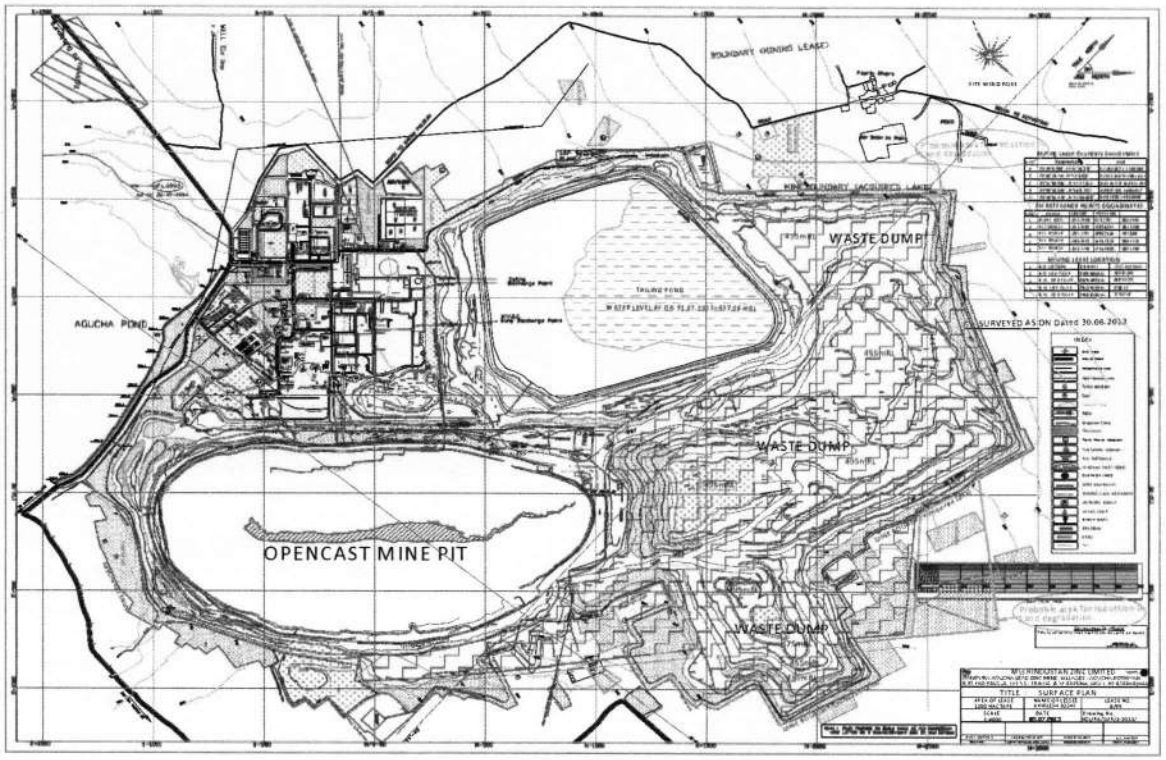

Fig. 1: Surface Plan of Rampura Aguch Mine

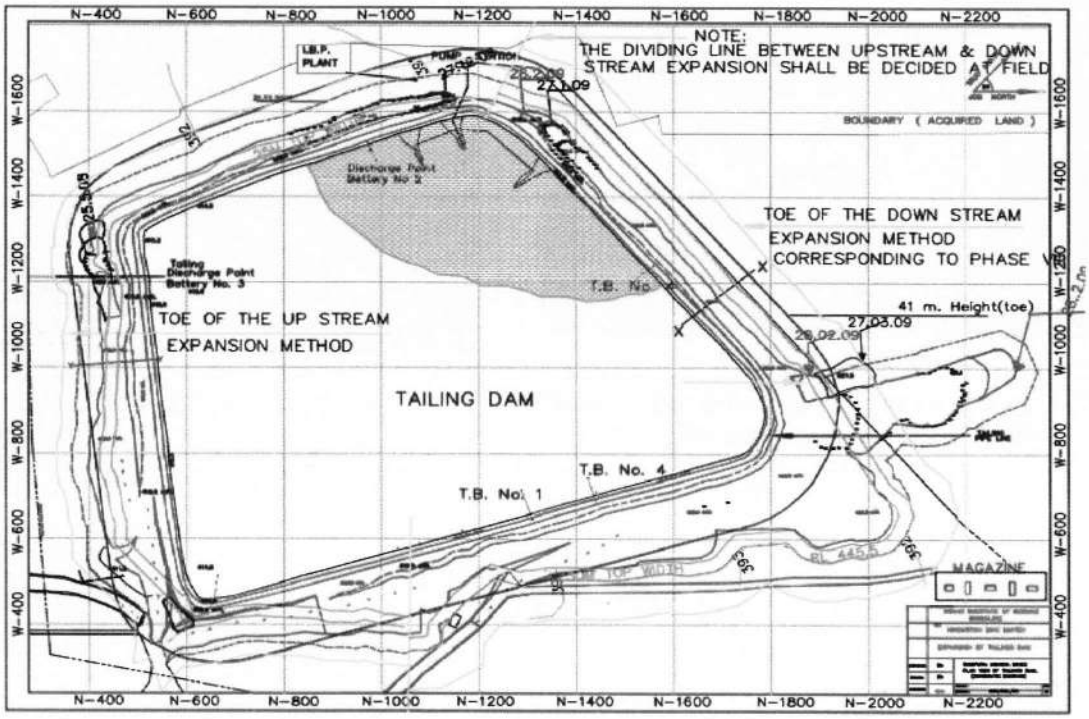

Fig. 2: Plan View of the Tailing Dam

Plate 1: Tailing Dam at RA Mine

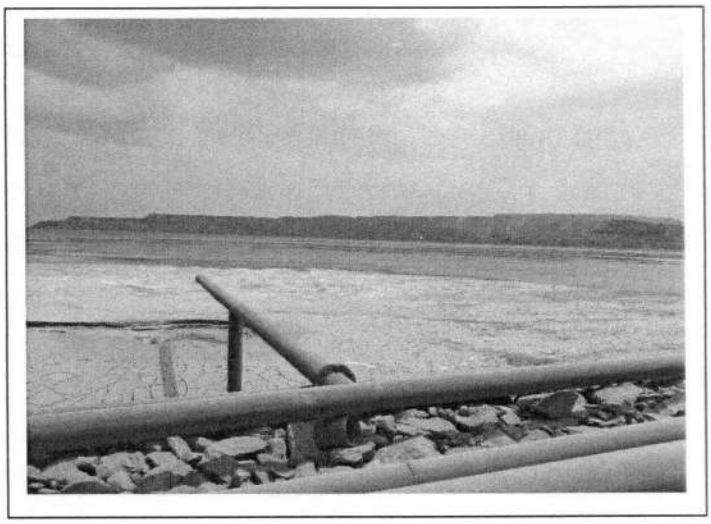

Plate 2: Piping system for transport and disposal of tailings in tailing Dam

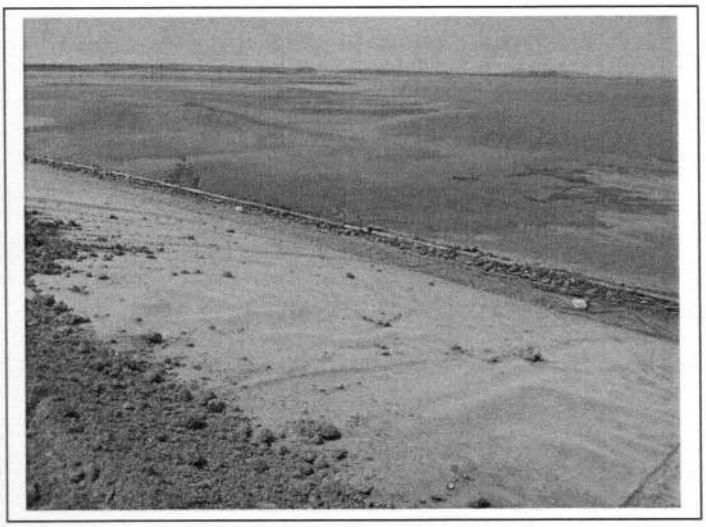

Plate 3: Installation of HDPE Liner on upstream slope of tailing Dam

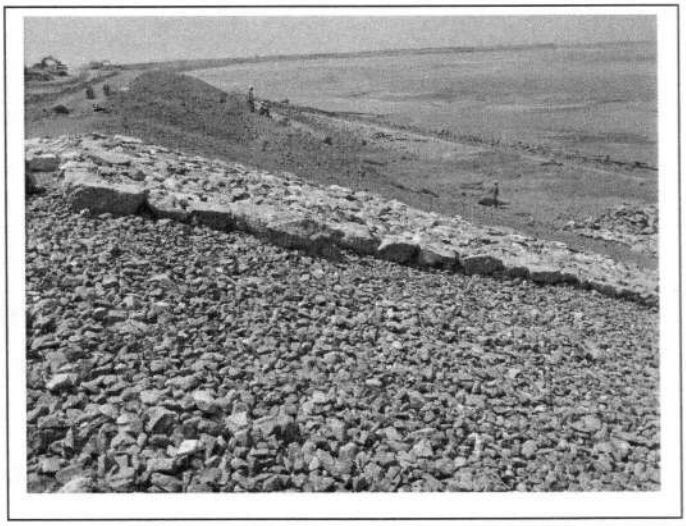

Plate 4: Stone Pitching for protection of HDPE Liner on upstream slope of tailing Dam

2.2 Geology, Hydrogeology and climatic features of the study area:

Relevant geological, hydrogeological and climatic data/information pertaining to the present study have been collected, compiled and summarized in the following sections. CSIR-NEERI had collected and complied background information on geology and hydrogeology of the area based on the following study reports:

#1: "Hydrology and hydrogeology of core and buffer zone of Rampura-Agucha mine and the impact of mining on water regime", Report by Hydro-Geosurvey Consultants P. Ltd, Jaipur, February 2004

#2: "Study and Review of Geological Stability of Tailing Dam at Rampura-Agucha Mine of Hindustan Zinc Ltd.", Department of Geology, Mohanlal Sukhadia University, Udaipur, 2000

2.2.1 Geology:

The RA Mine of HZL is located 52 km NNE of Bhilwara having 25°50'00" north latitude and 74°44'15" east longitude. The general elevation of the land is about 390 meters above mean sea level (MSL) and the mine fall in the survey of India Toposheet Nos. 45 K/9 and 45 K/13 which forms a part of Hurda tehsil of Bhilwara district.

The area is characterized by a partially elevated plateau, cluster hills on either sides and is situated within Aravali ranges trending NE-SW. It is mainly an undulating landscape formed due to fluvial activity developed due to river systems. **The area, in general, has alluvial soils of fluvial origin with varying from shallow to moderate depth.** The RA Mine area is drained by river Mansi that flows on its southern side at a distance of about 2.0 km.

A review of the topography and drainage pattern in the 10 km area reveals that the general slope of the area is towards east north-east and is about 0.6 m/km.

Geological reports also highlight that the soil cover in the area is not very thick. The depth of overburden over the entire area is found to be very shallow varying from 1.2 m to 2 m as per the foundation investigations carried

out earlier by HZL. Hard Granitic gneiss is found at 10 to 15m below the ground. The weathered rock lies in between the overburden and hard granitic layer. The lithological strata show the presence of black/brownish yellow colored topsoil and weathered rock.

The geophysical data as summarized by various studies clearly highlights that the top soil is clayey soil and they behave like aquacludes, which generally do not permit water to percolate through it. The nearby surface outcrop rocks clearly suggest that **the rocks at the site of the tailing dam are hard, compact and massive with very few joints and therefore the chances of permeability through such a strata will be negligible**.

2.2.2 Hydrogeology

The groundwater occurs under water table conditions in the weathered rocks of banded gneissic complex (BGC) and is transmitted through fractures, joints and foliations. BGC rocks are impervious in nature and have developed secondary porosity only due to joints and fractures. There is a very limited thickness of weathered BGC rocks. **The depth of groundwater in BGC rocks ranges from 8 to 10 m below the land surface near the river courses, reservoirs and ponds during post monsoon period while it is deeper in the other area from 10 to 20 meters below land surface.** The fluctuations due to rainfall and groundwater withdrawal are significant as the rocks have very low fractures, porosity and hydraulic conductivity.

The groundwater flow is also towards east and northeast following the general slope of the area. The hydraulic gradients estimated from the monitoring of wells of the area is 2.58 to 2.66 m/km.

Due to the impervious natures of BGC rocks, the hydraulic conductivity is very low. Though no pump tests were carried out to calculate the hydraulic conductivity, the data on pump tests carried out in similar formations elsewhere indicate a **hydraulic conductivity of 0.02 to 5 cu.m/day/sq.m. The very low**

values of hydraulic conductivity and specific capacity of wells in the area indicate a poor groundwater potential in the area. This is also evident from the results of few exploratory tubewells drilled by HZL in the area between the tailing dam and the mine, which yielded very low discharges indicating very low hydraulic conductivity. It also indicates that the fractures and joints present in the gneisses are not extensive and not well connected to each other.

There are few open wells in the mine area, which are occasionally pumped. These wells yield a meager discharge ranging from 50 to 100 m^3/day of potable quality of water. These wells do not sustain pumping more than few hours and go dry and recoup only after 12 to 16 hours, **further confirming very low hydraulic conductivity.**

The main source of groundwater recharge is by the rainfall by direct percolation to the zone of saturation. There is a well-developed drainage in the area due to loamy soil. **A significant part of rainfall is lost as runoff from the area due to loamy soils. A limited percentage of rainfall therefore reaches zone of saturation and becomes the part of groundwater storage after meeting the evaporation and evapo-transpiration losses. It is estimated that out of a total average annual rainfall of 600 mm, about 10 –15 % reaches the zone of saturation.** The groundwater recharge in the mine area (1200 hectares) is estimated to be 0.482 to 0.693 million cubic meter.

2.2.3 Climate

Based on the data available with Indian Meteorological Department (IMD) station at Ajmer (located 80 km away from the RA Mine), the mine area may be classified as tropical steppe, semi-arid and hot. The area is characterized by four seasons. The winter season is from mid–December to February followed by summer season from March to mid-July. The monsoon season is from mid-July to mid-September followed by post-monsoon season from mid-September to mid-December.

The maximum temperature of 45° C is recorded in the month of May whereas a minimum temperature of 3° C is recorded in the month of January.

The average annual precipitation based on rainfall data recorded at the RA Mine is around 600 mm. Out of the total annual rainfall, about 90 % fall in the monsoon months and remaining 10 % fall in the other three seasons.

The relative humidity during the southwest monsoon is generally above 60 %. During rest of the year, air is normally dry. The relative humidity during the summer months is as low as 20 % while during monsoon months it does not exceed more than 80 %.

The winds are generally light to moderate, except during the south-west monsoon season, when these are moderate to strong. The mean wind speed is highest in June (14.6 km/hr) and lowest in November (2.3 km/hr). In the post monsoon and winter months, the wind direction is from WSW and NE whereas during summer months, the wind blows from NW and SW.

Thus based on the climatic features the RA Mine area can be classified as arid zone.

The above mentioned data/information on geology, hydrogeology and climatic features of the study area has been used for assessing the aquifer vulnerability study and is presented in next Chapter of the report.

3.0 Assessment of Aquifer Vulnerability

3.1 Preamble

The impact of mining activities on groundwater through various pathways can be the assessed by carrying out "groundwater (aquifer) vulnerability" studies.

The aquifer vulnerability is the relative ease with which a contaminant applied on or near the land surface can migrate to the aquifer of interest under a given set of land use management practice, contaminant characteristics and aquifer sensitivity conditions.

The assessment of aquifer vulnerability (pollution potential of an aquifer) is a study pertaining to a combination of hydrogeologic factors, anthropogenic impacts or influences, and contamination sources in a given area.

A number of models are available for assessing the aquifer vulnerability (AV) to contamination. These models obviously depend on the various hydrogeologic features of the study area. Among these models, the most comprehensive and commonly used model in assessing groundwater vulnerability is the DRASTIC model (*Aller et al, 1987*). DRASTIC methodology was originally developed by the USA Environmental Protection Agency (USEPA) and is one of the worldwide used standardized systems for evaluation of groundwater vulnerability (*Merchant, 1994, Lobo-Ferreira and Olivera, 1997, Babiker et al. (communicated), Added and Hamza, 1999, SDVC Report 98-01, 1998, IST-1999-10337, 2003*).

In view of the comprehensive nature, the worldwide acceptance and application of the DRASTIC model in assessing aquifer vulnerability, the present study has been carried out using DRASTIC model.

3.2 DRASTIC Model

The DRASTIC acronym stands for the 7 hydrogeological factors that are taken into account in calculating groundwater vulnerability. These are described in the following sections:

3.2.1 **Depth to water** (D)

Depth to water constitutes the thickness of ground a contaminant must travel before reaching the ground water table. It consequently impacts on the degree of interaction between the percolating contaminant and subsurface materials (air, minerals, water) and, therefore, on the degree, extent, physical and chemical attenuation and degradation processes. In general, the aquifer potential protection increases with depth to water.

3.2.2 **Net Recharge** (R)

The net recharge is defined as the amount of water from precipitation and other artificial sources available to migrate down to the ground water. Recharge water is, therefore, a significant vehicle for percolating and transporting contaminants within the vadose zone to the saturated zone. Net recharge is calculated on an annual basis by summing each monthly data obtained from: precipitation, artificial recharge, superficial run-off, ground moisture content, evaporation and plant transpiration. The algorithm allowing the net recharge calculation is:

$$R_i = (P_i + IR_i - r/O_i - D\,ST_i - AET_i)$$

where:

R_i = net recharge in the i-th month (mm)
P_i = rainfall in the i-th month (mm)
IR_i = artificial recharge in the i-th month (mm)
r/O_i = superficial run-off in the i-th month (mm)
DST_i = variation of the soil moisture content in the i-th month (mm)
AET_i = actual evapotranspiration in the i-th month (mm)

3.2.3 **Aquifer media** (A)

Aquifer media refers to the subsurface formations capable of yielding water in pores. The contaminant attenuation of aquifer depends on the amount and sorting of fines. In general, the lower is the grain size, the higher can be assumed the attenuation capacity of aquifer media.

3.2.4 **Soil media** (S)

Soil media is the uppermost and weathered part of the ground, which is characterized by significant biological activity and exchanges with the atmosphere. Soil cover characteristics influence the surface and downward movement of contaminants. The presence of fine grain size materials, such as clay, peat or silt, and the remarkable percentage of organic matter within the soil cover can decrease intrinsic permeability, and retard or prevent contaminant migration via physico-chemical processes (i.e., adsorption, ionic exchange, oxidation, biodegradation).

3.2.5 **Topography** (T)

Topography (slope of the ground surface) will give an indication on whether a pollutant will run off or remain on the surface long enough to infiltrate into the groundwater. In general, more the slope of the ground, less will be the groundwater pollution potential.

3.2.6 **Impact of the vadose zone** (I)

The vadose zone is defined as the ground portion found between the aquifer and the soil cover in which pores or joints are unsaturated or only discontinuously saturated. The influence of vadose zone on aquifer pollution potential is essentially similar to that of soil cover, depending on its permeability, and on the attenuation characteristics of the media.

Most of the physical and chemical processes taking place in this zone (i.e., biodegradation, oxidation-reduction reactions, volatilization) are strongly influenced by depth. Filtration and dispersion are remarkably impacted by the

media's physical characteristics, which control pathways and path length within the layered subsurface environments.

3.2.7 **Hydraulic conductivity** (C)

Aquifer hydraulic conductivity refers to the ability of the aquifer formation to transmit water. It depends on the amount and degree of interconnection between empty spaces inside the rock media. This critical factor controls the contaminant migration and dispersion from the injection point within the saturated zone. In general, more is the hydraulic conductivity more will be the groundwater pollution potential.

3.3 Assessment of Aquifer Vulnerability

In the present study the assessment of aquifer vulnerability was carried out using the above-mentioned seven critical factors of the DRASTIC model. The aquifer vulnerability assessment was carried out according to the following steps:

- Identification of the most suitable potential terms (**classes**) for each critical factor and definition of the corresponding degrees of impact (**rating**). This is done with reference to seven tables of class-index assignment. Each table is referred to a single critical factor;
  - Definition of the relative influence of each critical factor (**Weights**);
  - Computation of aquifer vulnerability index using the rating and weight for each factor of the DRASTIC model

3.3.1 Assignment of Rating to DRASTIC Factors

The rating has been assigned to each critical factor, based on appropriate parameters, which constitute specific classes within the factor. A class can be represented by a range of values for a physical parameter (viz. hydraulic conductivity or depth of water) or by a media type (such as lithological description for aquifer and soil media). The rating associated with each class increase from 1 to 10 with the increasing aquifer pollution potential.

For each critical factor a typical classification and the rating is available (*Noble G.1992; "Siting of Landfills and Other LULUs", Economic Publishing Co. U.S.A., pp 3 –11.*). **Tables 1 to 7** list the defined classes with respect to the aquifer pollutant protection, and the assigned rating. The highest rating (10) indicates the highest pollution potential and the lowest rating (1) indicates the lowest pollution potential.

Table1: Typical classes and ratings for depth to groundwater

Depth to groundwater (m)	Rating
0 -2	10
2 -5	9
5 -10	7
10 -15	5
15 -20	3
20 -30	2
> 30	1

Table 2: Typical classes and ratings for net recharge

Net Recharge (cm)	Rating
0 - 5	1
5 - 10	3
10 - 18	6
18 - 25	8
> 25	9

Table 3:Typical classes and ratings for aquifer media

Aquifer media	Rating
Karst Limestone	10
Basalt	9
Sand and Gravel	8
Massive Limestone	6
Massive sandstone	6
Beded sandstone, limestone, and shale sequences	6
Glacial till	5
Weathered Metamorphic/Igneous	4
Metamorphics/Igneous	3
Massive Shale	2

Table 4: Typical classes and ratings for soil media

Soil media	Rating
Thin or absent	10
Gravel	10
Sand	9
Peat	8
Shrinking and/or aggregated clay	7
Sandy Loam	6
Loam	5
Silt Loam	4
Clay loam	3
Muck	2
Nonshrinking and nonaggregated clay	1

Table 5: Classes and ratings for topography (surface slope)

Surface Slope (%)	Rating
0-2	10
2-6	9
6-12	6
12-18	3
> 18	1

Table 6: Classes and ratings for vadose zone properties

Vadose zone media	Rating
Confining Layer	1
Silt/clay	3
Shale	3
Metamorphic/Igneous	4
Limestone	6
Sandstone	6
Bedded limestone, sandstone, shale	6
Sand and gravel with significant silt and clay	6
Sand and Gravel	8
Basalt	9
Karst Limestone	10

Table 7: Classes and ratings for hydraulic conductivity

Hydraulic conductivity (cm/s)	Index
$< 10^{-7}$	1
10^{-7} - 10^{-5}	2
10^{-5} - 10^{-3}	3
10^{-3} - 10^{-2}	5
10^{-2} - 10^{-1}	8

3.3.2 Weights of the Critical Factors

Each critical factor has been analyzed and comparatively evaluated with respect to others in order to define its relative importance in the vulnerability assessment. This relative importance is defined as weight of the factor. The weights have been assigned by means of a Ranked Pairwise Comparison Technique, resulting from analysis of case histories and expert judgments. The weights range between 1 and 5, according to their increasing importance in vulnerability assessment (Aller et al., 1987):

- Depth of water = **5**
- Net Recharge = **4**
- Aquifer media = **3**
- Soil media = **2**
- Topography = **1**
- Impact of the vadose zone = **5**
- and Hydraulic conductivity = **3**

The highest weights have been assigned to the factors affecting pathway and length of an infiltrating contaminant/contaminated water from the ground surface to the water table.

3.3.3 Aquifer Pollution Potential Index and Degree of Vulnerability

As mentioned earlier, critical factors have been defined and, within each factor ,appropriate classes have been selected. By determining and tabulating index values for each class, and by defining constant weights for each factor, the following equation (Aller et al., 1987) was used for determination of the aquifer pollution index for the tailing dam area.

$$I = D_r D_w + R_r R_w + A_r A_w + S_r S_w + T_r T_w + I_r I_w + C_r C_w$$

where:

I = Aquifer pollution potential index

r = rating for each DRASTIC factor

w = weight for the each DRSTIC factor

Values obtained represent a measure of the aquifer vulnerability, ranging from a minimum value of 26 to a maximum of 226. The higher the computed value, the higher is the aquifer vulnerability to percolating contaminants. The degree of vulnerability can be determined, based on the following assessment criteria (*Added A.; 1999*):

- Low aquifer vulnerability, if **I < 80**;
- Moderate aquifer vulnerability, if **80 < V < 120**;
- High aquifer vulnerability, if **120 < V < 160**;
- Very high aquifer vulnerability, if **160 < V < 185**;
- Extremely high Aquifer vulnerability, if **V > 185**

3.3.4 Calculation of Aquifer Pollution Potential Index and Assessment of Degree of Vulnerability

As indicated earlier, NEERI had carried out Aquifer vulnerability study in 2006, using USEPA's DRASTIC tool which is based on various geological and hydrogeological features of the site. Since geological and hydrogeological data is not expected to change significantly in last one decade and since the data/information on these aspects is based on the previously available reports,

the aquifer vulnerability Index is not expected to change. Therefore, the same data has been used in the present study and compared with various classes (**Table 1 to Table 7**) for assigning appropriate rating to each DRASTIC factor. The rating for each factor was then multiplied with the assigned weight for calculating the score for each DRASTIC feature. The score for each DRSTIC feature was summed up to arrive at the aquifer pollution potential index.

Table 8 lists the data for each DRASTIC factor, the assigned rating, weight, score for each factor and the total aquifer pollution potential index. Based on the aquifer pollution potential index, the degree of aquifer vulnerability was determined as per the criteria mentioned in section 3.0.

Table 8: Computation of Aquifer Pollution Potential Index for Tailing Dam Site at RA Mine

DRASTIC Factor	Observed data/value at RAM	Data Source	Assigned Rating	Weight	Score
D	10 m below ground level	#1	6	5	30
R	2.6 cm	#1 & by Calculation	1	4	4
A	Weathered Banded gneisses (crystalline metamorphics)	#1 & # 2	4	3	12
S	Clay Loam (2.3 –4.5 m)	#1, #2	3	2	6
T	0.06 %	#1	10	1	10
I	Clay loam & Metamorphic/Igneous	#1	3	5	15
C	5.7×10^{-4}	#1	3	3	9
Aquifer Pollution Potential Index					**86**

#1: "Hydrology and hydrogeology of core and buffer zone of Rampura-Agucha mine and the impact of mining on water regime", Report by Hydro-Geosurvey Consultants P. Ltd, Jaipur, February 2004

#2: "Study and Review of Geological Stability of Tailing Dam at Rampura-Agucha Mine of Hindustan Zinc Ltd.", Department of Geology, Mohanlal Sukhadia University, Udaipur, 2000

3.4 Assessment of Aquifer Vulnerability:

It can be observed from **Table 8** that the overall aquifer pollution potential index at the Rampura-Agucha tailing dam site is **86**. The comparison of this score with degree of vulnerability (Section 3.3.3) indicated that the calculated score of

aquifer pollution potential index (**86**) using the DRASTIC model falls under low to moderate category of aquifer vulnerability. The low to moderate aquifer vulnerability suggests that the tailing dam at RA Mine has been constructed over the areas which have low to moderate groundwater contamination potential. This is evident from the depth of groundwater table (10 m below ground level) and the characteristics of surface soil and vadose zone (clay loam) in and around tailing dam area which will restrict the direct infiltration of water from the tailing dam (if any) to the groundwater table. Further, the very low values of hydraulic conductivity and specific capacity of wells in the area indicate a poor groundwater potential in the area. This fact was also confirmed during the visit to the RA Mine, when a negligible flow of groundwater was observed in the mine pit (more than 90 meters deep at the time of visit) located adjacent to the tailing dam.

Thus, based on the overall score of the aquifer pollution potential index (**86**) using the DRASTIC criteria, very high depth of groundwater table, impervious characteristics of subsurface formations and poor groundwater potential of the area, it can be concluded that the present tailing dam at RAM may not pose any significant danger to the existing groundwater resources in the area. However, as mentioned in Section 2.2, the tailing dam is experiencing a seepage of water since its construction and operation in year 1994. Hence a detailed groundwater monitoring in and around the mine lease area is warranted to verify/validate the interpretations drawn based on aquifer vulnerability study. The details of groundwater monitoring are presented in next chapter.

Although, as established by geophysical and hydrogeological studies, the existence of clay-loam soil and impervious **hard, compact and massive rock strata in the subsurface beneath the tailing dam prohibits the percolation of seepage water to the underlying aquifer,** a detailed groundwater monitoring study is recommended in and around the RA Mine area for validation of the of above findings.

4.0 Assessment of Groundwater Quality

4.1 Introduction:

The assessment of aquifer vulnerability due to tailing disposal at RA Mine of Hindustan Zinc Ltd., using DRASTIC model has indicated a low to moderate category of aquifer vulnerability (a total score of 86). Since calculation of this score is based on various assumptions and available data on various hydrogeological features of the site, a detailed groundwater monitoring of groundwater sources around the tailing dam is necessary to verify and validate these predictions. Moreover, as stated in Section 2.1, the tailing dam is also experiencing seepage from north-western corner for past few years. The possibility of groundwater contamination due to the seepage cannot be ruled out. A detailed groundwater monitoring was therefore carried out around the tailing dam of RA Mine. The groundwater monitoring was carried out for two seasons viz. Post-monsoon (October 2015) and Summer (March 2016) so as to account for seasonal variations. The details of groundwater monitoring are presented in following section.

4.2 Groundwater Monitoring:

The existing sources of groundwater (dugwells, handpumps, borewells) around the tailing dam were identified. The representative groundwater monitoring locations were selected in the upstream, sidewise and downstream of tailing dam, keeping in view the groundwater flow direction, which is in the east and north-eastern direction. As mentioned earlier, groundwater quality in and around tailing dam was monitored for two seasons (post-monsoon and summer). In addition to the groundwater, sample of fresh tailing slurry, recycle water from the tailing dam and the seepage water from the tailing dam were also collected during both the seasons, to establish correlation between the quality of tailing dam water and the groundwater, if any. As mentioned earlier,

there is a seepage of water from the north-western side of the tailing dam for past few years. In order to assess the impact of seepage water through surface run-off on nearby surface water bodies, two surface water samples were also collected from the nearby ponds/lakes.

The tailing slurry, tailing dam water, seepage water, groundwater and surface water samples were subjected to detailed physico-chemical and heavy metal analysis. The details of sampling locations, physico-chemical characteristics and heavy metal contents of the tailing slurry, tailing dam water, seepage water, groundwater and surface water samples are listed in **Table 9** to **Table 18**. The groundwater sampling locations are depicted in **Fig. 3.**

Fig. 3: Groundwater Sampling Locations around the Tailing Dam

Table 9: Details of Sampling Location

Sample ID	Location
T1	Seepage Water from Tailing Dam
T2	Supernatant of Tailing Slurry
T3	Reclaimed Water from Tailing Dam

Table 10: Physico-chemical Characteristics of Tailing Dam Water (October 2015)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
T1	6.81	9830	4343	1712	1.28	79	n.d.	2236	185	62	79	450	86	928
T2	5.52	6870	6031	2487	1.17	30	n.d.	2446	148	114	71	482	112	892
T3	6.57	5420	3878	556	1.46	14	n.d.	91	122	101	67	461	102	808

Table 11: Physico-chemical Characteristics of Tailing Dam Water (March 2016)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
T1	6.41	11100	6712	3158	1.7	13	n.d.	1024	1158	78	165	976	23	2600
T2	5.74	7382	6502	2554	2.4	59	n.d.	2809	446	148	44	1033	28	2200
T3	6.81	6127	6392	2233	3.8	83	n.d.	83	1293	125	112	999	9	2340

Table 12: Heavy Metal Content of Tailing Dam Water (October 2015)

(All Values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
T1	0.031	0.009	0.115	0.010	0.027	0.021	2.120	0.749	0.190	0.044	42
T2	0.040	0.018	0.013	0.006	0.033	0.043	3.890	6.550	0.255	1.390	8.90
T3	0.173	0.016	0.015	0.004	0.021	0.053	3.470	7.880	0.162	1.016	6.37

Table 13: Heavy Metal Content of Tailing Dam Water (March 2016)

(All Values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
T1	0.390	0.009	0.408	0.042	0.002	0.136	3.520	0.698	0.216	0.159	87
T2	0.091	0.015	0.026	0.012	0.002	0.112	3.790	4.111	0.075	0.316	7.46
T3	0.140	0.011	0.052	0.013	0.001	0.099	3.620	7.860	0.061	0.367	17.90

Table 14 : Details of Groundwater Sampling Locations

Sr. No.	Sample ID	Latitude	Longitude	Location	Distance & Groundwater Flow Direction w.r.t. Tailing Dam	Type of Source	Depth (Feet)
2	Raw-2	74.7267582	25.8180861	Agucha Near Pond	1.815 km Upstream	DW	23
3	Raw-3	74.7337687	25.800508	Parsurampura	1.653 km Upstream	HP	25
4	Raw-4	74.7305622	25.7850044	Bhagwanpura	2.223 km Upstream	DW	40
5	Raw-5	74.7554929	25.7987808	Balapura	2.238 km Upstream	DW	13
6	Raw-6	74.7611538	25.7824429	Amartya	3.036 km Upstream	DW	50
7	Raw-7	74.7440999	25.78215	Urja ka kheda	2.037 km Upstream	DW	70
8	Raw-8	74.7448585	25.8185903	Beru kheda	1.044 km Upstream	DW	50
9	Raw-9	74.766317	25.8372457	Kalyan pura	2.88 km Sidewise	DW	50
10	Raw-10	74.6983709	25.8187966	Jaisingh pura	4.796 km Sidewise	DW	30
11	Raw-11	74.6926841	25.8420421	Devpura	5.343 km Sidewise	DW	60
12	Raw-12	74.7012562	25.8715132	Zinc colony (outside)	4.427 km Sidewise	DW	40
14	Raw-14	74.7245914	25.8911574	Naya lakshmi Pura	2.148 km Sidewise	DW	80
15	Raw-15	74.753474	25.8778218	Near Kotari Village	1.633 km Downstream	DW	75
16	Raw-16	74.7754101	25.8671649	Kotiya	3.895 km Downstream	BW	100
17	Raw-17	74.7877955	25.8616425	Harniya	5.252 km Downstream	BW	250
18	Raw-18	74.8012795	25.8620474	Daulatpura	6.75 km Downstream	DW	60
20	Raw-20	74.7353993	25.7317666	Jasoria	3.526 km Upstream Control Remote Location	DW	80

Table 15: Physico-chemical Characteristics of Groundwater Samples (October 2015)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
Upstream														
Raw-2	7.21	6550	3200	1510	1.45	125	n.d.	394	95	144	51	680	126	292
Raw-3	7.5	3880	1555	519	3.56	65	n.d.	99	23	5.70	15	498	159	80
Raw-4	7.82	1870	1410	680	1.73	41	n.d.	215	38	5.42	19	208	188	112
Raw-5	7.55	18800	12008	--	0.68	n.a.	n.d.	158	35	74	146	1454	167	72
Raw-6	7.7	2710	1612	818	1.77	31	n.d.	501	27	8.46	16	277	182	80
Raw-7	7.74	2750	1092	74	n.a.	27	n.d.	50	31	9.66	20	333	172	88
Raw-8	7.65	2750	1112	289	0.26	48	n.d.	178	49	39	36	235	168	152
Sidewise														
Raw-9	8.32	1685	857	413	0.59	10	n.d.	53	7.02	3.23	3.87	237	492	32
Raw-10	7.48	Over Range	12510	9246	19	86	n.d.	1814	496	50	177	1572	142	1480
Raw-11	7.55	4970	2124	807	2.68	18	n.d.	304	50	10	32	516	158	144
Raw-12	8.4	1705	639	42	n.a.	37	n.d.	81	9.46	3.65	8.31	227	530	36
Raw-14	7.83	10820	5214	3469	6.91	96	n.d.	1385	268	48	148	760	192	804
Downstream														
Raw-15	7.7	2340	911	181	0.52	40	n.d.	126	53	2.39	42	227	178	180
Raw-16	7.38	4140	1651	11	0.69	0.62	n.d.	8.67	82	5.39	54	393	134	264
Raw-17	7.32	3730	1659	18	n.a.	n.a.	n.d.	34	75	8.72	45	403	127	92
Raw-18	7.4	5830	2532	1194	1.77	16	n.d	935	98	9.87	67	544	146	328
Control														
Raw-20	7.9	3000	1249	272	n.a.	15	n.d.	45	35	7.17	33	337	206	152

N.D. - Not detected

Table 16: Physico-chemical Characteristics of Groundwater Samples (March 2016)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
Upstream														
Raw-2	7.10	7670	3240	1710	2.8	130	n.d.	484	65	65	91	859	580	393
Raw-3	7.67	3430	1504	536	1.7	65	n.d.	96	6.9	6.9	15	619	660	160
Raw-4	7.58	2530	954	487	1.2	16	n.d.	62	7.1	7.1	28	312	328	280
Raw-5	8.00	19910	11680	4021	1.2	ND	n.d.	378	46	46	269	3046	396	205
Raw-6	7.76	3080	1100	463	1.0	13	n.d.	61	9.2	9.2	17	398	428	160
Raw-7	8.22	2720	1080	281	0.8	29	n.d.	61	8.1	8.1	17	387	540	140
Raw-8	8.29	4950	1988	768	1.4	5.8	n.d.	381	30	30	51	641	700	360
Sidewise														
Raw-9	8.32	2250	930	383	ND	40	n.d.	131	12	4.4	4.1	279	548	60
Raw-10	7.71	Over Range	10522	7321	16.3	86	n.d.	1527	252	27	238	3239	468	1910
Raw-11	7.51	4810	2052	698	1.6	34	n.d.	386	46	9.6	27	707	660	240
Raw-12	8.18	1910	794	101	0.4	28	n.d.	57	12	6.8	6.9	300	456	60
Raw-14	7.28	8410	5770	3217	6.9	95	n.d.	1254	587	29	174	1238	328	1700
Downstream														
Raw-15	8.16	2510	1070	233	0.5	26	n.d.	124	48	4.2	30	326	178	220
Raw-16	8.25	9190	2154	567	1.2	19	n.d.	488	398	12	167	968	134	1180
Raw-17	7.31	4560	1832	896	0.2	28	n.d.	225	111	8.0	53	466	127	440
Raw-18	7.51	4270	1958	732	1.4	8.1	n.d	572	96	9.2	42	609	146	336
Control														
Raw-20	7.81	3130	1192	477	0.1	15	n.a.	20	58	7.9	35	387	368	240

N.D.- Not Detected

Table 17: Heavy Metal Content of Groundwater Samples
(October 2015)
(All values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
Upstream											
Raw-2	0.024	0.020	ND	0.001	0.097	0.018	0.590	0.005	0.042	0.009	0.064
Raw-3	0.002	0.009	ND	ND	0.059	0.024	0.135	0.012	0.010	ND	0.128
Raw-4	0.006	0.005	ND	ND	0.038	0.006	0.232	0.000	0.016	0.002	0.071
Raw-5	ND	ND	ND	ND	0.000	0.000	0.000	0.000	0.000	ND	0.050
Raw-6	0.040	0.003	ND	ND	0.024	0.008	0.117	0.002	0.006	0.001	0.018
Raw-7	0.008	0.006	ND	ND	0.038	0.014	0.196	0.005	0.014	ND	0.003
Raw-8	0.001	0.006	ND	ND	0.038	0.012	0.306	0.001	0.021	0.001	0.003
Sidewise											
Raw-9	0.370	0.002	ND	ND	0.010	0.011	0.297	0.005	0.005	0.003	0.039
Raw-10	0.073	0.122	ND	0.002	0.390	0.243	2.475	0.009	0.203	0.009	0.040
Raw-11	0.008	0.008	ND	ND	0.088	0.070	0.405	0.021	0.027	0.002	0.010
Raw-12	0.269	0.001	ND	ND	0.011	0.014	0.249	0.003	0.006	0.006	0.050
Raw-14	0.013	0.033	ND	0.001	0.105	0.058	2.815	0.020	0.195	0.002	0.013
Downstream											
Raw-15	0.109	0.003	ND	ND	0.018	0.015	0.566	0.008	0.034	0.003	0.019
Raw-16	0.022	0.009	ND	ND	0.048	0.022	0.715	0.002	0.050	0.001	0.016
Raw-17	0.011	0.008	ND	ND	0.048	0.019	0.798	0.001	0.055	ND	0.035
Raw-18	0.018	0.003	ND	ND	0.017	0.018	0.525	0.001	0.037	0.001	0.017
Control											
Raw-20	0.022	0.004	ND	ND	0.025	0.011	0.226	0.005	0.016	0.003	0.334

N.D. - Not Detected

Table 18: Heavy Metal Content of Groundwater Samples
(March 2016)
(All values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
Upstream											
Raw-2	0.178	0.007	ND	0.001	0.027	0.078	0.780	0.060	0.055	0.003	0.045
Raw-3	0.081	0.002	ND	ND	0.015	0.107	0.260	0.027	0.011	0.005	0.760
Raw-4	0.066	0.003	ND	ND	0.015	0.022	0.257	0.004	0.023	0.001	0.020
Raw-5	0.111	0.011	ND	ND	0.025	0.388	0.003	0.156	0.008	0.001	0.027
Raw-6	0.075	0.002	ND	ND	0.014	0.050	0.154	0.008	0.017	0.002	0.019
Raw-7	0.315	0.002	ND	ND	0.012	0.026	0.307	0.012	0.016	0.003	0.027
Raw-8	0.707	0.011	ND	ND	0.023	0.053	0.542	0.088	0.032	0.008	0.000
Sidewise											
Raw-9	0.059	0.001	ND	ND	0.003	0.030	0.026	0.006	0.006	0.003	0.021
Raw-10	0.096	0.024	ND	0.001	0.064	0.277	1.220	0.002	0.062	0.001	0.026
Raw-11	0.306	0.008	ND	ND	0.026	0.071	0.451	0.023	0.022	0.011	0.052
Raw-12	0.191	0.003	ND	ND	0.010	0.027	0.113	0.006	0.007	0.004	0.056
Raw-14	0.222	0.023	ND	0.001	0.049	0.073	1.760	0.051	0.121	0.002	0.038
Downstream											
Raw-15	0.146	0.006	ND	0.001	0.015	0.031	0.226	0.011	0.018	0.002	0.038
Raw-16	ND	0.021	ND	0.002	0.050	0.127	1.080	0.013	0.112	0.002	0.008
Raw-17	0.119	0.011	ND	0.001	0.038	0.077	1.360	0.058	0.059	0.001	0.866
Raw-18	0.224	0.008	ND	0.001	0.023	0.138	0.455	0.046	0.047	0.004	1.620
Control											
Raw-20	0.065	0.001	ND	ND	0.002	0.003	0.217	0.001	0.003	0.000	0.005

Table 19 : Details of Surface Water Sampling Locations

Sr. No.	Sample ID	Latitude	Longitude	Location	Type of Source
1	Raw-1	74.727515	25.8258999	Agucha pond	Pond
13	Raw-13	74.6844353	25.8988517	Hurda Pond	Pond

Table 20: Physico-chemical Characteristics of Surface Water Samples (October 2015)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
Raw-1	8.78	500	159	227	0.67	22	n.a.	63	43	5.27	5.59	32	532	68
Raw-13	9.52	480	118	44	n.a.	3.29	n.a.	19	13	5.20	4.26	45	876	28

Table 21: Physico-chemical Characteristics of Surface Water Samples (March 2016)

(All Values except pH and Conductivity are expressed in mg/L)

Sample ID	pH	Conductivity (µs)	TDS	Cl	Br	NO3	PO4	SO4	Ca	K	Mg	Na	Alkalinity	Hardness
Raw-1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Raw-13	8.9	719	302	67	N.D	N.D.	N.D.	15	19	6.2	7.6	74	128	100

Table 22: Heavy Metal Content of Tailing Dam Water (October 2015)

(All Values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
Raw-1	1.385	0.002	ND	0.001	0.004	0.006	1.270	0.056	0.021	0.037	0.166
Raw-13	0.192	0.006	ND	ND	0.009	0.007	0.346	0.026	0.011	0.003	0.017

Table 23: Heavy Metal Content of Tailing Dam Water (March 2016)

(All Values are expressed in mg/L)

	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
Raw-1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Raw-13	0.57	0.008	ND	ND	0.006	0.013	0.778	0.158	0.012	0.005	0.045

4.3 Observation on Groundwater Monitoring

It may be observed from the characteristics of fresh tailing slurry (supernatant), tailing dam water and seepage water (**Table 10** to **Table 13),** that the major parameters of concern are the total dissolved solids (TDS), chloride, sulphate, sodium, lead, zinc, iron and manganese. It is however observed from **Table 10** to **Table 13** that, the concentration of abovementioned parameters in samples collected during October 2015 is comparatively less as compared to the samples collected during March 2016. The lower concentration of these parameters during October 2015 monitoring may be attributed to the dilution effect due to monsoon/post-monsoon season. Nevertheless, considering the higher concentration of these parameters during both the monitoring, the quality of groundwater is likely to be affected in terms of these parameters in case the seepage water percolates to the underlying aquifer. The assessment of groundwater quality was therefore carried out with respect to these parameters.

It may be observed from **Table 15 and Table 16,** that concentration of TDS, chloride, sulphates and sodium is in general high in all the groundwater samples, irrespective of their location (upstream, side wise or downstream of Tailing Dam). It may also be observed from **Table 17 and 18,** that the concentration of heavy metals either in upstream, downstream or sidewise of Tailing Dam is in the similar range and no significant increase was observed in the downstream of tailing dam.

The assessment of groundwater quality around the Tailing Dam of RAM, thus indicate that there is no co-relation between the characteristics of Tailing Dam water and the groundwater quality around the Tailing Dam especially in the downstream direction (North, North-east, east). It is therefore concluded that construction and operation of Tailing Dam at RAM has not posed any threat to groundwater resources in the area. The high values of TDS, chlorides, sulphates, and sodium, which was observed both in upstream as well as downstream of Tailing Dam may be attributed to the local geological and hydrogeological setup of the study area.

Although there is a seepage of water from the tailing dam for last fewyears, the contamination of groundwater has not occurred, possibly due to existence of clayey soil and hard, compact and massive outcrop rocks beneath the tailing dam area as established through reported geophysical investigations.

The predictions of the aquifer vulnerability assessment (low to moderate groundwater pollution potential) as presented in Section 3.4, thus matches with the findings of the assessment of groundwater quality around the Tailing Dam of RAM and hence validated.

5.0 Conclusions & Recommendations

- RA Mine excavates 6.15 million metric tonnes per annum (MMTPA) and beneficiates 6.5 MMTPA of lead-zinc ore collectively from other mines to produce zinc and lead concentrates of 53-54% and 60-65% respectively.

- During the ore beneficiation operations, RA Mine generates about 5 MMTPA of tailings. The tailings are transported in a slurry form to a confined area known as "Tailing Dam" which is located at a distance of about 800 m from the ore beneficiation plant. The tailings in the slurry form are discharged to the tailing dam through closed pipelines, wherein the solids settle at the bottom of the tailing dam and the supernatant (water) is recycled back to the beneficiation plant. About 50-60 % water from the tailings discharge is recycled back from the tailing dam to the ore beneficiation plant.

- The tailing dam encompasses about 1 sq-km area. The bund raising of the tailing dam has been done by using mine overburden and soil. The tailing dam has been constructed in phases. Bund rising in each phase is about 6m. At present the bund rising has been completed up to a height of 51 m (Phase VII) which is expected to be completed by June 2016. Due to the increase in the quantity of tailings and to accommodate present as well as future generation of tailings, HZL propose to increase the height of tailing dam up to 74 m in total XII phases.

- During the phase I construction, 0.4 m thick impervious layer was provided, on bottom as well as upstream slope. However, during subsequent Phases, impervious clay layer of 1 m to 2 m was used on upstream slope. During construction of Phase II onwards, a five layer system was adopted on the upstream slopes. The five layers include soil, sand, HDPE, stone aggregate and stone pitching.

- During the study, it was observed that the bund has been experiencing seepage on the north and the northwest corner of the tailing dam. The estimated average quantity of, seepage water is about 50 to 60 m^3 per hour through the bunds including the seasonal variations The same seepage was also reported by NEERI during the previous study in 2006. It may therefore be inferred that the seepage is taking place from the tailing dam for a long time.

- RA Mine has taken adequate control measures to channelize the seepage water by providing a lined canal and lined collection sumps of 1.2 lakh m^3 with adequate pumping capacity at a approx. cost of Rs. 600 La. The seepage collected through these channels and sumps is recycled back to the plant.

- However, the possibility of groundwater contamination by seepage cannot be ruled out in future due to the anthropogenic activities or natural calamities. Hence, HZL is recommended to take remedial measures for stoppage of seepage from the tailing dam. The remedial measures may include changes in the operational practice of tailing dam to control the seepage or use of engineering techniques to plug the breach in the tailing dam.

- In order to assess the potential impact of tailing dam on underlying groundwater resources, an aquifer vulnerability study was carried for tailing dam site of RA Mine using hydrogeologic model, namely DRASTIC. The relevant data/information on geological, hydrogeological and climatic features of the study area needed for DRASTIC model was collected and compiled from the reports available with RA Mine.

- The assessment of aquifer vulnerability at tailing dam area using DRASTIC model indicated an overall aquifer pollution potential index of **86**. The comparison of this score with degree of vulnerability [<80 (low vulnerability) to >185 (high vulnerability)] indicated that the calculated score of aquifer pollution potential index (**86**) using the DRASTIC model falls under low to moderate category of aquifer vulnerability. The low to moderate aquifer vulnerability suggests that the tailing dam at RA Mine has been constructed over the areas which have low to moderate groundwater contamination potential.

- In order to validate the findings of aquifer vulnerability study, and to assess the impact of seepage water on groundwater resources, a detailed monitoring of tailing dam water, reclamation water, seepage water and groundwater quality around the tailing dam was carried out for post-monsoon and summer seasons.

- Comparison of characteristics of tailing dam water/seepage water with that of groundwater quality around the Tailing Dam of RA Mine, revealed that there is no co-relation between the characteristics of Tailing Dam water/seepage water and the groundwater quality around the Tailing Dam especially in the downstream direction (North, North-east, east). It is therefore concluded that construction and operation of Tailing Dam at RA Mine has not posed any threat to groundwater resources in the area. The high values of TDS, chlorides, sulphates, and sodium in groundwater, which was observed both in upstream as well as downstream of Tailing Dam may be attributed to the local geological and hydrogeological setup of the study area.

- Although there is a seepage of water from the tailing dam for last few years, the contamination of groundwater has not occurred, possibly due to existence of clayey soil and hard, compact and massive rocks beneath the tailing dam area as established through reported geophysical investigations.

- The predictions of the aquifer vulnerability assessment (low to moderate groundwater pollution potential) thus matches with the findings of the assessment of groundwater quality around the Tailing Dam of RA Mine and hence validated.

- Based on the overall score of the aquifer pollution potential index (**86**) using the DRASTIC criteria, high depth of groundwater table, impervious characteristics of subsurface formations and poor groundwater potential of the area, it may be concluded that the tailing dam at RAM do not pose any significant danger to the existing groundwater resources in the area. Moreover, further increase in height of tailing dam to 74 would also not pose any threat to aquifer.

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By Speed Post

No. J-11015/267/2008-IA.II (M)
Government of India
Ministry of Environment, Forests & Climate Change
Impact Assessment Division
***

Indira Paryavaran Bhavan,
3rd Floor, Vayu Wing,
Aliganj, Jor Bagh Road,
New Delhi-110 003.

Dated: 22nd August, 2014

To,

M/s Hindustan Zinc Ltd.
Rampura Agucha Mine,
P.O. Agucha,
District Bhilwara,
Rajasthan-311 029.

Sub.: Rampura Agucha Lead and Zinc Opencast and Underground mining Project of (5.0 million TPA to 6.15 million TPA) and Beneficiation Capacity of Beneficiation Plant (5.0 million TPA to 6.15 million TPA) of M/s Hindustan Zinc Ltd., located at Village Agucha, Tehsil Hurda, District Bhilwara, Rajasthan (Consultant: Vimta Labs, Hyderabad)- Amendment in EC regarding.

Ref.: Environmental Clearance letter of even No dated 11.12.2009 & its amendment vide letter of even No. dated 05.03.2012

This has reference to your letter No. HZL/RAM/ENV/2013-14 dated 18.04.2013 and subsequent letters dated 18.05.2013, 14.10.2013 & 28.05.2014 regarding above mentioned proposal for amendment in the specific condition no. (v) of the Environmental Clearance accorded vide letter of even no. dated 11th December, 2009 with regard to increasing the dump height from 100 m to 140 m. The Mine is located at village-Agucha, Tehsil Hurda, District Bhilwara, Rajasthan.

2. The proposal was considered in the 9th Reconstituted EAC meeting held during July 22-24, 2013, 19th Meeting held during April 29-30, 2014 & 20th Meeting held during May 28-30, 2014 wherein the Committee recommended the proposal for proposed raising of the dump height from 100m to 140m (in two lifts of 20m each) with additional specific conditions.

3. Your request for amendments to the Environmental Clearance has been examined in the Ministry and accordingly the specific conditions No. V of the said environmental clearance letter of even no. dated 11.12.2009 as amended on 05.03.2012, **"..... The maximum height of the dump should not exceed**

100m.", shall now be substituted by "…..**The maximum height of the dump should not exceed 140m (in two lifts of 20m each)"** along with the following additional specific conditions:-

(i) The open cracks, whenever developed in the partially consolidated new dump mass, should be consolidated with proper filling/leveling with the help of dozer / compactors.

(ii) Dump foundation preparation should be done by excavating and removing soil before dumping, to improve the frictional resistance at the base of dump. It should be filled with Over burden containing stones.

(iii) There should not be any dumping in pool water or on slushy ground.

(iv) Discontinuous dumping should be avoided to check water accumulation between two isolated dumps.

(v) During rainy season, an officer should be deputed to go in and around the dump site every morning to see the effectiveness of drain. If any blockage is observed, immediate steps should be taken to make it effective.

(vi) The dumps should be surveyed periodically to produce up-to-date and accurate dump geometry.

(vii) The slope and stability monitoring by Radar should be done and its report should be sent to MoEF and its Regional office every six-months.

(viii) The dump design should be reviewed by CIMFR or any other scientific agency after reaching dump height of 120m and its report sent to MoEF and its Regional office.

(ix) Waste dump has to be managed as per the guidelines of DGMS and quarterly monitoring report to be submitted to DGMS and regional office.

(x) On stabilized dumps, more species such as *Pongamia, Bombax ceiba,* Tamarind, Arjun, *Gravillea robusta* and Amla to be planted.

(xi) The Radar monitoring system should satisfactorily sub-serve the dual objectives viz. (a) Investigative Monitoring to provide an understanding of the slope behaviour over time and typical response to external events (e.g. Precipitation and seasonal fluctuations) and (b). Predictive Monitoring: To provide a warning of a change in behaviour, enabling the possibility of limiting or intervening to prevent hazardous sliding. The data so analyzed should be provided with reference to the above.

(xii) Paved drains are to be provided to protect the slope surfaces against rain-cuts and seepage during rains to make a safe way to discharge top and surface water to the bottom of the dump. Constant vigilance on the condition of dumps with special reference to accumulation of water and development of cracks.

(xiii) Regular Monitoring of above mentioned specific conditions shall be included in the monitoring plan and report submitted to the Ministry of Environment,

Forests and Climate Change and its Regional Office located at Lucknow on six monthly basis.

4. All other terms and conditions mentioned in this Ministry's letter of even no. dated 11th December, 2009 and its amendments on 05.03.2012 shall remain the same.

5. This issues with the approval of the Competent Authority.

(Dr. V.P. Upadhyay)
Director

Copy to:

1). **The Secretary**, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi
2). **The Department of Mines & Geology**, Government of Rajasthan, Secretariat, Jaipur
3). **The Secretary,** Department of Environment, Government of Rajasthan, Secretariat, Jaipur
4). **The Secretary**, Department of Forests, Government of Rajasthan, Secretariat, Jaipur
5). **The Addl. Principal Chief Conservator of Forests**, Central Region, Ministry of Environment and Forests, B-1/72, Sector-A, Aliganj, Lucknow-226020.
6). **The Member Secretary**, Central Ground Water Authority, A-2, W3, Curzon Road Barracks, K.G. Marg, New Delhi-110001.
7). **The Chairman**, Rajasthan State Pollution Control Board, 4, Institutional area, Jhalana, Doongri, Jaipur.
8). **The Controller General**, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur - 440 001
9). **The District Collector**, Bhilwara District, Rajasthan.
10). **Guard File**
11). **MoEF website.**

(Dr. V.P. Upadhyay)
Director

Block- Hurda

S. No.	Panchayat Name	Village Name	Habitation Name	Location	Type Of Source	Lab	Lab Testing Date	Above P. mandatory	Below P. Mandatory	Above P. Emerging	Below P. Emerging	test Id	Habitation Id	Lat.	Long.
1.0	AGUNCHA	AGOOCHA	AGUNCHA	Sr. Secondary School/ Scheme Name: Jalmani Hurda,/SC1752114	Shallow Tubewell	District PHED Lab Bhilwara	30/10/2017		Nitrate[35.000 mg/l],Fluoride[1.200 mg/l],Chloride[90.000 mg/l],pH[7.600 pH],TDS[670.000 mg/l],Alkalinity[390.000 mg/l]		Total Coliform[0.000 MPN/100ml],Hardness[272.000 mg/l]	L0022954791	HabsId : 0000882880	25.824069	74.727319
				Sr. Secondary School/ Scheme Name: Aagucha,/H370112018	Delivery Point	District PHED Lab Bhilwara	18/12/2020		Nitrate[9.000 mg/l],Fluoride[0.900 mg/l],Chloride[100.000 mg/l],pH[8.500 pH],TDS[842.000 mg/l],Alkalinity[420.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[71.000 mg/l],Calcium[56.000 mg/l],Magnesium[43.200 mg/l],Hardness[320.000 mg/l]	L0035209613	HabsId : 0000882880		
				Sr. Secondary School/ Scheme Name: Aagucha,/H370112018	Delivery Point	District PHED Lab Bhilwara	07/01/2021		Nitrate[3.200 mg/l],Fluoride[0.800 mg/l],Chloride[130.000 mg/l],pH[8.500 pH],TDS[623.000 mg/l],Alkalinity[360.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.400 NTU],Sulphates[30.000 mg/l],Calcium[56.000 mg/l],Magnesium[38.400 mg/l],Hardness[300.000 mg/l]	L0035468485	HabsId : 0000882880		
2.0	AGUNCHA	AGOOCHA	AGUNCHA	KALAL MOHALLA/ Scheme Name: LAMBA-HP,/SC5444343	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Chloride[1450.000 mg/l],Nitrate[426.000 mg/l],TDS[5400.000 mg/l]	Fluoride[0.600 mg/l],pH[7.700 pH],Alkalinity[500.000 mg/l]	Sulphates[560.000 mg/l],Calcium[280.000 mg/l],Magnesium[124.800 mg/l],Hardness[1220.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021385157	HabsId : 0000882880	25.820715	74.724081
				KALAL MOHALLA/ Scheme Name: LAMBA-HP,/SC5444343	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Fluoride[1.800 mg/l],Nitrate[160.200 mg/l],TDS[2720.000 mg/l]	Chloride[860.000 mg/l],pH[7.600 pH],Alkalinity[500.000 mg/l]	Hardness[660.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.700 NTU],Sulphates[367.300 mg/l],Calcium[124.000 mg/l],Magnesium[84.000 mg/l]	L0030765327	HabsId : 0000882880		
				KALAL MOHALLA/ Scheme Name: LAMBA-HP,/SC5444343	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Nitrate[100.000 mg/l],Alkalinity[620.000 mg/l]	Fluoride[1.100 mg/l],Chloride[220.000 mg/l],pH[8.300 pH],TDS[1210.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[116.000 mg/l],Calcium[68.000 mg/l],Magnesium[38.400 mg/l],Hardness[330.000 mg/l]	L0035209492	HabsId : 0000882880		
3.0	AGUNCHA	AGOOCHA	AGUNCHA	NAGAR MOHALLA/ Scheme Name: LAMBA-HP,/SC5444344	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Chloride[1040.000 mg/l],Nitrate[433.000 mg/l],TDS[4220.000 mg/l]	Fluoride[0.800 mg/l],pH[7.700 pH],Alkalinity[310.000 mg/l]	Sulphates[545.000 mg/l],Calcium[212.000 mg/l],Magnesium[180.000 mg/l],Hardness[1280.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021385247	HabsId : 0000882880	25.82038	74.725516
				NAGAR MOHALLA/ Scheme Name: LAMBA-HP,/SC5444344	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020		Nitrate[2.200 mg/l],Fluoride[0.500 mg/l],Chloride[90.000 mg/l],pH[8.200 pH],TDS[482.000 mg/l],Alkalinity[250.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.700 NTU],Sulphates[19.000 mg/l],Calcium[60.000 mg/l],Magnesium[16.800 mg/l],Hardness[220.000 mg/l]	L0035209531	HabsId : 0000882880		

4.0	AGUNCHA	AGOOCHA	AGUNCHA	NATH MOHALLA/ Scheme Name: LAMBA-HP,/SC5444334	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Chloride[1440.000 mg/l],Nitrate[433.100 mg/l],TDS[4580.000 mg/l]	Fluoride[1.200 mg/l],pH[7.800 pH],Alkalinity[420.000 mg/l]	Calcium[236.000 mg/l],Magnesium[124.800 mg/l],Hardne	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[394.800 mg/l]	L0030765358	HabsId : 0000882880	25.820184	74.725957
				NATH MOHALLA/ Scheme Name: LAMBA-HP,/SC5444334	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Chloride[2320.000 mg/l],Nitrate[440.000 mg/l],TDS[6180.000 mg/l],Alkalinity[620.000 mg/l]	Fluoride[1.100 mg/l],pH[7.300 pH]	Sulphates[751.000 mg/l],Calcium[640.000 mg/l],Magnesium[420.000 mg/l],Hardness[3350.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.200 NTU]	L0035209571	HabsId : 0000882880		
5.0	AGUNCHA	AGUNCHA	AGUNCHA	IN AGUCHA TALAB,/PU0002024907	Openwell	District PHED Lab Bhilwara	21/04/2017		Nitrate[1.900 mg/l],Fluoride[0.700 mg/l],Chloride[40.000 mg/l],pH[7.700 pH],TDS[300.000 mg/l],Alkalinity[110.000 mg/l]		Total Coliform[0.000 MPN/100ml],Calcium[36.000 mg/l],Magnesium[24.000 mg/l],Hardness[190.000 mg/l]	L0022258987	HabsId : 0000882880	**25.825582**	**74.72585**
				IN AGUCHA TALAB,/PU0002024907	Openwell	District PHED Lab Bhilwara	14/08/2017		Nitrate[39.500 mg/l],Fluoride[0.800 mg/l],Chloride[110.000 mg/l],pH[7.600 pH],TDS[570.000 mg/l],Alkalinity[250.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[69.000 mg/l],Calcium[44.000 mg/l],Magnesium[21.600 mg/l],Hardness[200.000 mg/l]	L0021385827	HabsId : 0000882880		
6.0	AGUNCHA	AGOOCHA	AGUNCHA	AGUCHA TALAB BANK NEAR DAK BANGLA,/PU0002024911	Tubewell	District PHED Lab Bhilwara	05/05/2017		Nitrate[5.100 mg/l],Fluoride[0.400 mg/l],Chloride[50.000 mg/l],pH[8.000 pH],TDS[337.000 mg/l],Alkalinity[200.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[16.000 mg/l],Calcium[24.000 mg/l],Magnesium[14.400 mg/l],Hardness[120.000 mg/l]	L0021385955	HabsId : 0000882880	25.82509	74.727077
7	AGUNCHA	AGOOCHA	AGUNCHA	HP AT ROAD SIDE,/PU0000374426	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Nitrate[104.000 mg/l],TDS[3190.000 mg/l]	Fluoride[0.900 mg/l],Chloride[850.000 mg/l],pH[8.500 pH],Alkalinity[490.000 mg/l]	Sulphates[500.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[80.000 mg/l],Magnesium[76.800 mg/l],Hardness[520.000 mg/l]	L0021385406	HabsId : 0000882880	25.819797	74.726738
8	AGUNCHA	AGOOCHA	AGUNCHA	HP OUT SIDE HOSPITAL,/PU0000911850	Shallow Tubewell	District PHED Lab Bhilwara	14/08/2017		Nitrate[36.500 mg/l],Fluoride[0.500 mg/l],Chloride[170.000 mg/l],pH[7.800 pH],TDS[650.000 mg/l],Alkalinity[300.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[68.000 mg/l],Calcium[40.000 mg/l],Magnesium[24.000 mg/l],Hardness[200.000 mg/l]	L0021386004	HabsId : 0000882880	25.82487	74.727204
9	AGUNCHA	AGOOCHA	AGUNCHA	GPS Gurjar Mohalla/ Scheme Name: Schools Hurda,/SC370051079	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Fluoride[1.600 mg/l],Nitrate[93.000 mg/l],TDS[2200.000 mg/l]	Chloride[350.000 mg/l],pH[8.500 pH],Alkalinity[480.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[300.000 mg/l],Calcium[56.000 mg/l],Magnesium[48.000 mg/l],Hardness[340.000 mg/l]	L0022258794	HabsId : 0000882880	25.821326	74.723858
				GPS Gurjar Mohalla/ Scheme Name: Schools Hurda,/SC370051079	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Nitrate[109.700 mg/l]	Fluoride[0.900 mg/l],Chloride[450.000 mg/l],pH[8.200 pH],TDS[1780.000 mg/l],Alkalinity[470.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.200 NTU],Sulphates[248.900 mg/l],Calcium[72.000 mg/l],Magnesium[48.000 mg/l],Hardness[380.000 mg/l]	L0030765289	HabsId : 0000882880		
10	AGUNCHA	AGOOCHA	AGUNCHA	GATI KE NICHE/ Scheme Name: LAMBA-HP,/SC5444332	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Nitrate[366.000 mg/l],TDS[4300.000 mg/l]	Fluoride[1.100 mg/l],Chloride[960.000 mg/l],pH[7.600 pH],Alkalinity[550.000 mg/l]	Sulphates[535.000 mg/l],Calcium[304.000	Total Coliform[0.000 MPN/100ml]	L0021385678	HabsId : 0000882880	25.820179	74.725006
11	AGUNCHA	AGOOCHA	AGUNCHA	HANUMAN JI KA STHAN/ Scheme Name: LAMBA-HP,/SC5444333	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Fluoride[2.400 mg/l]	Nitrate[44.100 mg/l],Chloride[240.000 mg/l],pH[8.400 pH],TDS[1160.000 mg/l],Alkalinity[430.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[197.000 mg/l],Calcium[44.000 mg/l],Magnesium[21.600 mg/l],Hardness[200.000 mg/l]	L0022258900	HabsId : 0000882880	25.81969	74.724933

12	AGUNCHA	AGOOCHA	AGUNCHA	JAT MOHALLA/ Scheme Name: LAMBA-HP,/SC5444336	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Nitrate[167.000 mg/l],TDS[3200.000 mg/l]	Fluoride[0.400 mg/l],Chloride[840.000 mg/l],pH[7.700 pH],Alkalinity[380.000 mg/l]	Sulphates[517.000 mg/l],Calcium[392.000 mg/l],Magnesium[196.800 mg/l],Hardness[1800.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021385210	HabsId : 0000882880	25.821667	74.726917
13	AGUNCHA	AGOOCHA	AGUNCHA	NR BUS STEND/ Scheme Name: LAMBA-HP,/SC5444338	Shallow Tubewell	District PHED Lab Bhilwara	14/08/2017		Nitrate[41.100 mg/l],Fluoride[0.500 mg/l],Chloride[110.000 mg/l],pH[7.400 pH],TDS[580.000 mg/l],Alkalinity[290.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[57.000 mg/l],Calcium[52.000 mg/l],Magnesium[31.200 mg/l],Hardness[260.000 mg/l]	L0021385871	HabsId : 0000882880	25.823174	74.727717
14	AGUNCHA	AGOOCHA	AGUNCHA	SHIVAJI KA STHAN/ Scheme Name: LAMBA-HP,/SC5444339	Shallow Tubewell	District PHED Lab Bhilwara	14/08/2017		Nitrate[34.100 mg/l],Fluoride[0.800 mg/l],Chloride[110.000 mg/l],pH[8.100 pH],TDS[400.000 mg/l],Alkalinity[200.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[34.000 mg/l],Calcium[24.000 mg/l],Magnesium[28.800 mg/l],Hardness[180.000 mg/l]	L0021385571	HabsId : 0000882880	25.826248	74.728619
15	AGUNCHA	AGOOCHA	AGUNCHA	SADAR BAHJAR/ Scheme Name: LAMBA-HP,/SC5444341	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Nitrate[186.000 mg/l],TDS[2130.000 mg/l]	Fluoride[0.800 mg/l],Chloride[300.000 mg/l],pH[8.300 pH],Alkalinity[530.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[302.000 mg/l],Calcium[40.000 mg/l],Magnesium[57.600 mg/l],Hardness[340.000 mg/l]	L0021385460	HabsId : 0000882880	25.821067	74.725152
16	AGUNCHA	AGOOCHA	AGUNCHA	PURANA SCHOOL BHAWAN/ Scheme Name: LAMBA-HP,/H6374748	Delivery Point	District PHED Lab Bhilwara	14/05/2019	Chloride[1810.000 mg/l],Nitrate[626.000 mg/l],TDS[8760.000 mg/l]	Fluoride[0.500 mg/l],pH[7.500 pH],Alkalinity[470.000 mg/l]	Calcium[252.000 mg/l],Magnesium[120.000	E.Coli[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[308.600 mg/l]	L0029286638	HabsId : 0000882880	25.819567	74.726933
17	AGUNCHA	AGOOCHA	AGUNCHA	BRAHAMAN MOHALLA/ Scheme Name: LAMBA-HP,/SC5444337	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Nitrate[191.000 mg/l],Alkalinity[660.000 mg/l]	Fluoride[1.300 mg/l],Chloride[310.000 mg/l],pH[7.700 pH],TDS[1640.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[230.500 mg/l],Calcium[96.000 mg/l],Magnesium[48.000 mg/l],Hardness[440.000 mg/l]	L0030765254	HabsId : 0000882880	25.822142	74.725931
18	Aguncha	Agoocha	Aguncha	Govt. Primary School/ Scheme Name: Aagucha,/H370112016	Delivery Point	District PHED Lab Bhilwara	18/12/2020	Chloride[1580.000 mg/l],Nitrate[437.000 mg/l],TDS[4150.000 mg/l],Alkalinity[640.000 mg/l]	Fluoride[1.500 mg/l],pH[7.500 pH]	Calcium[228.000 mg/l],Magnesium[182.400	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.800 NTU],Sulphates[270.000	L0035209444	HabsId : 0000882880	25.823048	74.7266
19	AGUNCHA	AGOOCHA	BHOPALPURA	HP AT ROAD SIDE,/PU0001112754	Shallow Tubewell	District PHED Lab Bhilwara	21/04/2017	Fluoride[5.600 mg/l],Nitrate[72.500 mg/l],Alkalinity[750.000 mg/l]	Chloride[470.000 mg/l],pH[7.500 pH],TDS[1765.000 mg/l]	Magnesium[121.200 mg/l],Hardness[795.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[116.000 mg/l]	L0022253468	HabsId : 0000882883	25.800568	74.73377
20	AGUNCHA	AGOOCHA	INDRAJI KA KHERA	HP BERWA BASTI,/PU0001112756	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Chloride[1650.000 mg/l],Nitrate[421.000 mg/l],TDS[5600.000 mg/l]	Fluoride[0.500 mg/l],pH[7.800 pH],Alkalinity[600.000 mg/l]	Sulphates[540.000 mg/l],Calcium[244.000 mg/l],Magnesium[204.000 mg/l],Hardness[1460.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0022259084	HabsId : 0000882884	25.796117	74.708217
				CHAMAR MOHALLA 1/ Scheme Name: LAMBA-HP,/SC5444505	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Fluoride[3.700 mg/l],Alkalinity[660.000 mg/l]	Nitrate[39.860 mg/l],Chloride[540.000 mg/l],pH[8.200 pH],TDS[1678.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[101.900 mg/l],Calcium[44.000 mg/l],Magnesium[21.600 mg/l],Hardness[200.000 mg/l]	L0030765459	HabsId : 0000882884		

21	AGUNCHA	AGOOCHA	INDRAJI KA KHERA	NR DEV JI KA STHAN/ Scheme Name: LAMBA-HP,/SC5444503	Shallow Tubewell	District PHED Lab Bhilwara	16/08/2017	Chloride[1310.000 mg/l],Nitrate[91.000 mg/l],TDS[3850.000 mg/l]	Fluoride[1.000 mg/l],pH[8.500 pH],Alkalinity[490.000 mg/l]	Sulphates[490.000 mg/l],Magnesium[112.800 mg/l],Hardness[880.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[164.000 mg/l]	L0022259140	HabsId : 0000882884	25.801247	74.70149
				NR DEV JI KA STHAN/ Scheme Name: LAMBA-HP,/SC5444503	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Fluoride[3.800 mg/l]	Nitrate[1.470 mg/l],Chloride[130.000 mg/l],pH[8.300 pH],TDS[657.000 mg/l],Alkalinity[400.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.700 NTU],Sulphates[26.160 mg/l],Calcium[20.000 mg/l],Magnesium[9.600 mg/l],Hardness[90.000 mg/l]	L0030765501	HabsId : 0000882884		
22	AGUNCHA	AGOOCHA	INDRAJI KA KHERA	In village/ Scheme Name: Indra Ji ka khera,/SC3163992	Shallow Tubewell	District PHED Lab Bhilwara	17/12/2019	Fluoride[2.300 mg/l]	Nitrate[2.430 mg/l],Chloride[120.000 mg/l],pH[8.200 pH],TDS[517.000 mg/l],Alkalinity[320.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.400 NTU],Sulphates[4.130 mg/l],Calcium[44.000 mg/l],Magnesium[14.400 mg/l],Hardness[170.000 mg/l]	L0030765431	HabsId : 0000882884	25.796912	74.706947
23.0	AGUNCHA	AGOOCHA	Parasrampura	VISHRANTI GRAHA KE PAS/ Scheme Name: LAMBA-HP,/SC5444428	Shallow Tubewell	District PHED Lab Bhilwara	24/04/2017	Chloride[1570.000 mg/l],Nitrate[406.000 mg/l],TDS[4240.000 mg/l]	Fluoride[1.000 mg/l],pH[7.600 pH],Alkalinity[290.000 mg/l]	Calcium[332.000 mg/l],Magnesium[264.500 mg/l],Hardness[1932.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0022258666	HabsId : 0000882881	25.814702	74.726287
24.0	Aguncha	Agoocha	Parasrampura	NADI KE KINARE/ Scheme Name: LAMBA-HP,/SC5444424	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Nitrate[72.000 mg/l],TDS[2070.000 mg/l]	Fluoride[1.500 mg/l],Chloride[680.000 mg/l],pH[8.000 pH],Alkalinity[450.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[191.000 mg/l],Calcium[112.000 mg/l],Magnesium[52.800 mg/l],Hardness[500.000 mg/l]	L0035209989	HabsId : 0000882881	25.815616	74.726216
25.0	Aguncha	Agoocha	Parasrampura	IN SIDE OF GUPS PARSRAMPURA/ Scheme Name: LAMBA-HP,/SC5444427	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[1.700 mg/l],Nitrate[262.000 mg/l],TDS[2170.000 mg/l]	Chloride[650.000 mg/l],pH[7.700 pH],Alkalinity[500.000 mg/l]	Magnesium[146.400 mg/l],Hardness[1100.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[210.000 mg/l],Calcium[196.000 mg/l]	L0035209946	HabsId : 0000882881	25.814915	74.722386
26.0	Aguncha	Agoocha	Parasrampura	CHAMAR MOHALLA BAJAR/ Scheme Name: LAMBA-HP,/SC5444431	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[2.000 mg/l],Chloride[1500.000 mg/l],TDS[3480.000 mg/l]	Nitrate[35.000 mg/l],pH[7.800 pH],Alkalinity[500.000 mg/l]	Calcium[256.000 mg/l],Magnesium[120.000 mg/l],Hardness[1140.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.200 NTU],Sulphates[197.000 mg/l]	L0035209898	HabsId : 0000882881	25.81241	74.720939
27.0	Aguncha	Agoocha	Parasrampura	BHIL MOHALLA 2/ Scheme Name: LAMBA-HP,/SC5444433	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020		Nitrate[1.300 mg/l],Fluoride[0.540 mg/l],Chloride[110.000 mg/l],pH[8.300 pH],TDS[551.000 mg/l],Alkalinity[260.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.500 NTU],Sulphates[21.000 mg/l],Calcium[76.000 mg/l],Magnesium[16.800 mg/l],Hardness[260.000 mg/l]	L0035209846	HabsId : 0000882881	25.813949	74.720663

28.0	AGUNCHA	AGOOCHA	RAMPURA	NR PUMP/ Scheme Name: LAMBA-HP,/SC5444550	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Nitrate[62.900 mg/l],TDS[2630.000 mg/l]	Fluoride[0.700 mg/l],Chloride[510.000 mg/l],pH[7.800 pH],Alkalinity[370.000 mg/l]	Sulphates[560.000 mg/l],Calcium[240.000 mg/l],Magnesium[153.600 mg/l],Hardness[1240.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021386610	HabsId : 0000882882	25.842129	74.714733
29.0	AGUNCHA	AGOOCHA	RAMPURA	NR GPS/ Scheme Name: LAMBA-HP,/SC5444552	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Nitrate[76.900 mg/l],TDS[2350.000 mg/l],Alkalinity[700.000 mg/l]	Fluoride[1.200 mg/l],Chloride[500.000 mg/l],pH[7.700 pH]	Magnesium[153.600 mg/l],Hardness[940.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[367.000 mg/l],Calcium[120.000 mg/l]	L0021386372	HabsId : 0000882882	25.84001	74.714933
30.0	AGUNCHA	AGOOCHA	RAMPURA	SUB CENTER KE PAS/ Scheme Name: LAMBA-HP,/SC5444554	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Chloride[1070.000 mg/l],Nitrate[406.000 mg/l],TDS[4500.000 mg/l]	Fluoride[0.300 mg/l],pH[7.600 pH],Alkalinity[280.000 mg/l]	Sulphates[411.000 mg/l],Calcium[488.000 mg/l],Magnesium[336.000 mg/l],Hardness[2620.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0022259337	HabsId : 0000882882	25.841363	74.714502
31.0	AGUNCHA	AGOOCHA	RAMPURA	KALBELIYA BASTI/ Scheme Name: LAMBA-HP,/SC5444555	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Chloride[1170.000 mg/l],Nitrate[202.000 mg/l],TDS[3380.000 mg/l]	Fluoride[0.400 mg/l],pH[7.400 pH],Alkalinity[390.000 mg/l]	Sulphates[530.000 mg/l],Calcium[396.000 mg/l],Magnesium[228.000 mg/l],Hardness[1940.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021386466	HabsId : 0000882882	25.839019	74.716498
32.0	AGUNCHA	AGOOCHA	RAMPURA	GURJAR MOHALLA/ Scheme Name: LAMBA-HP,/SC5444557	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Chloride[1010.000 mg/l],Nitrate[71.300 mg/l],TDS[3690.000 mg/l]	Fluoride[1.200 mg/l],pH[8.000 pH],Alkalinity[360.000 mg/l]	Sulphates[1780.000 mg/l],Calcium[280.000 mg/l],Magnesium[254.400 mg/l],Hardness[1760.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0021386422	HabsId : 0000882882	25.840423	74.716331
33.0	AGUNCHA	AGOOCHA	RAMPURA	MALI MOHALLA/ Scheme Name: LAMBA-HP,/SC5444558	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Nitrate[189.000 mg/l],TDS[3240.000 mg/l]	Fluoride[0.500 mg/l],Chloride[860.000 mg/l],pH[7.500 pH],Alkalinity[450.000 mg/l]	Calcium[392.000 mg/l],Magnesium[196.800 mg/l],Hardness[1800.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[400.000 mg/l]	L0021386524	HabsId : 0000882882	25.840808	74.716944
				MALI MOHALLA/ Scheme Name: LAMBA-HP,/SC5444558	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Chloride[2200.000 mg/l],Nitrate[440.000 mg/l],TDS[5270.000 mg/l]	Fluoride[0.600 mg/l],pH[7.900 pH],Alkalinity[430.000 mg/l]	Calcium[600.000 mg/l],Magnesium[264.000 mg/l],Hardness[2600.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.200 NTU],Sulphates[376.000 mg/l]	L0035216353	HabsId : 0000882882		

34.0	AGUNCHA	AGOOCHA	RAMPURA	CHAMAR MOHALLA/ Scheme Name: LAMBA-HP,/SC5444559	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Nitrate[231.000 mg/l],TDS[3150.000 mg/l]	Fluoride[0.400 mg/l],Chloride[880.000 mg/l],pH[7.600 pH],Alkalinity[310.000 mg/l]	Sulphates[460.000 mg/l],Calcium[400.000 mg/l],Hardness[1400.000 mg/l]	Total Coliform[0.000 MPN/100ml],Magnesium[96.000 mg/l]	L0021386269	HabsId : 0000882882	25.840271	74.716771
35.0	Aguncha	Agoocha	Rampura	NR GLR/ Scheme Name: LAMBA-HP,/SC5444553	Shallow Tubewell	District PHED Lab Bhilwara	07/01/2021	Chloride[2300.000 mg/l],Nitrate[400.000 mg/l],TDS[5490.000 mg/l]	Fluoride[0.620 mg/l],pH[7.300 pH],Alkalinity[450.000 mg/l]	Sulphates[473.000 mg/l],Calcium[640.000 mg/l],Magnesium[264.000 mg/l],Hardness[2700.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.500 NTU]	L0035468861	HabsId : 0000882882	25.840974	74.71548
36.0	AGUNCHA	Moon ji ka khera	MOONJI KA KHERA	HP NR BALAJI,/PU0001112758	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Fluoride[2.900 mg/l],Nitrate[98.400 mg/l],TDS[4360.000 mg/l]	Chloride[940.000 mg/l],pH[8.000 pH],Alkalinity[450.000 mg/l]	Sulphates[570.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[104.000 mg/l],Magnesium[52.800 mg/l],Hardness[480.000 mg/l]	L0021386792	HabsId : 0000882885	25.83973	74.709238
37.0	AGUNCHA	Moon ji ka khera	MOONJI KA KHERA	NR BUS STEND/ Scheme Name: LAMBA-HP,/SC5444576	Shallow Tubewell	District PHED Lab Bhilwara	24/04/2017	Fluoride[4.500 mg/l],Nitrate[130.000 mg/l],TDS[2070.000 mg/l]	Chloride[660.000 mg/l],pH[7.700 pH],Alkalinity[540.000 mg/l]	Magnesium[240.000 mg/l],Hardness[1390.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[156.000 mg/l]	L0022259648	HabsId : 0000882885	25.844184	74.710083
				HP NR REST HOUSE,/PU0001112759	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Fluoride[4.200 mg/l],Nitrate[94.600 mg/l],TDS[2380.000 mg/l],Alkalinity[680.000 mg/l]	Chloride[680.000 mg/l],pH[8.100 pH]		Total Coliform[0.000 MPN/100ml],Sulphates[344.000 mg/l],Calcium[40.000 mg/l],Magnesium[86.400 mg/l],Hardness[460.000 mg/l]	L0021386897	HabsId : 0000882885		
38.0	AGUNCHA	Moon ji ka khera	MOONJI KA KHERA	HP CHAMAR MOHALLA,/PU0001112762	Shallow Tubewell	District PHED Lab Bhilwara	17/08/2017	Fluoride[4.100 mg/l],Nitrate[90.400 mg/l],Alkalinity[760.000 mg/l]	Chloride[320.000 mg/l],pH[8.400 pH],TDS[2000.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[260.000 mg/l],Calcium[48.000 mg/l],Magnesium[19.200 mg/l],Hardness[200.000 mg/l]	L0021386835	HabsId : 0000882885	25.844346	74.710226
39	AGUNCHA	BHAIROON KHERA	BHERU KHERA NEW	Govt. Primary School/ Scheme Name: Jalmani Hurda,/SC1752111	Shallow Tubewell	District PHED Lab Bhilwara	24/04/2017	Fluoride[4.800 mg/l],Chloride[1760.000 mg/l],Nitrate[60.000 mg/l],TDS[4280.000 mg/l]	pH[7.800 pH],Alkalinity[480.000 mg/l]	Magnesium[189.600 mg/l],Hardness[1280.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[196.000 mg/l]	L0022259556	HabsId : 0000882887	25.817355	74.756613
40	AGUNCHA	BHAGWANPURA	BHAGWANPURA	HP DEV NARAYAN KA STAN,/PU0000556472	Shallow Tubewell	District PHED Lab Bhilwara	24/04/2017	Fluoride[3.500 mg/l],Nitrate[52.000 mg/l]	Chloride[430.000 mg/l],pH[7.900 pH],TDS[1429.000 mg/l],Alkalinity[440.000 mg/l]	Magnesium[139.200 mg/l],Hardness[840.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[104.000 mg/l]	L0022259526	HabsId : 0000882886	25.786631	74.728222
41	BARANTIYA	AMARTIYA	AMARTIYA	HP NR PUBLIC WELL,/PU0000374428	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[4.800 mg/l],Nitrate[58.000 mg/l],TDS[2300.000 mg/l],Alkalinity[1080.000 mg/l]	Chloride[610.000 mg/l],pH[8.100 pH]		Total Coliform[0.000 MPN/100ml],Calcium[60.800 mg/l],Magnesium[30.960 mg/l],Hardness[281.000 mg/l]	L0022260077	HabsId : 0000882808	25.79141	74.764074
42	BARANTIYA	Amartiya	Amartiya	Near bhil mohlla/ Scheme Name: SC Basti Hurda,/SC5206226	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[3.200 mg/l],Chloride[1100.000 mg/l],Nitrate[153.000 mg/l],TDS[2870.000 mg/l]	pH[8.100 pH],Alkalinity[470.000 mg/l]	Calcium[204.000 mg/l],Magnesium[132.000 mg/l],Hardne	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.800 NTU],Sulphates[214.000 mg/l]	L0036009512	HabsId : 0000882808	25.790191	74.765623
43	BARANTIYA	AMARTIYA	NAYA KHERA	HP HANUMAN TEMPLE,/PU0001112770	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[3.500 mg/l]	Nitrate[13.000 mg/l],Chloride[520.000 mg/l],pH[8.100 pH],TDS[1340.000 mg/l],Alkalinity[430.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[99.200 mg/l],Calcium[40.000 mg/l],Magnesium[33.600 mg/l],Hardness[240.000 mg/l]	L0023493500	HabsId : 0000882809	25.789922	74.767226

44	BARANTIYA	AMARTIYA	NAYA KHERA	HP DEV NARAYAN KA STAN,/PU0001112773	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[3.400 mg/l]	Nitrate[20.000 mg/l],Chloride[690.000 mg/l],pH[7.800 pH],TDS[1730.000 mg/l],Alkalinity[300.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[174.000 mg/l],Calcium[44.000 mg/l],Magnesium[52.800 mg/l],Hardness[330.000 mg/l]	L0023493553	HabsId : 0000882809	25.788589	74.768388
45	BARANTIYA	BALAPURA	BALAPURA	HP GURJER MOHALLA,/PU0001112794	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[4.900 mg/l],Nitrate[50.100 mg/l],TDS[2510.000 mg/l],Alkalinity[750.000 mg/l]	Chloride[590.000 mg/l],pH[8.500 pH]		Total Coliform[0.000 MPN/100ml],Sulphates[196.000 mg/l],Calcium[13.600 mg/l],Magnesium[28.800 mg/l],Hardness[154.000 mg/l]	L0021387074	HabsId : 0000882810	25.796196	74.754005
46	BARANTIYA	Balapura	Balapura	BHIL MOHALLA/ Scheme Name: LAMBA-HP,/SC5445274	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[4.400 mg/l],TDS[2060.000 mg/l]	Nitrate[19.000 mg/l],Chloride[820.000 mg/l],pH[8.300 pH],Alkalinity[510.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.500 NTU],Sulphates[183.000 mg/l],Calcium[88.000 mg/l],Magnesium[79.200	L0035216379	HabsId : 0000882810	25.799446	74.749794
47.0	BARANTIYA	Balapura	BALAYO KA KHERA	HP AMARTIA ROAD,/PU0001112790	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[4.700 mg/l],Nitrate[48.000 mg/l],TDS[2350.000 mg/l],Alkalinity[1000.000 mg/l]	Chloride[530.000 mg/l],pH[8.500 pH]		Total Coliform[0.000 MPN/100ml],Sulphates[248.000 mg/l],Calcium[70.000 mg/l],Magnesium[40.320 mg/l],Hardness[343.000 mg/l]	L0022260130	HabsId : 0000882811	25.796491	74.752434
48.0	BARANTIYA	BARANTIYA	BARANDHIYA	HP HOSPITAL,/PU0000911856	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017		Nitrate[6.220 mg/l],Fluoride[1.300 mg/l],Chloride[260.000 mg/l],pH[8.500 pH],TDS[1114.000 mg/l],Alkalinity[350.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[66.000 mg/l],Calcium[16.000 mg/l],Magnesium[22.320 mg/l],Hardness[133.000 mg/l]	L0021387154	HabsId : 0000882804	25.763378	74.742604
				HP HOSPITAL,/PU0000911856	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Nitrate[54.000 mg/l]	Fluoride[1.500 mg/l],Chloride[200.000 mg/l],pH[8.100 pH],TDS[820.000 mg/l],Alkalinity[380.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[60.600 mg/l],Calcium[56.000 mg/l],Magnesium[38.400 mg/l],Hardness[300.000 mg/l]	L0026473690	HabsId : 0000882804		
49.0	BARANTIYA	BARANTIYA	BARANDHIYA	HP BUS STAND,/PU0000374430	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[1.600 mg/l],Nitrate[52.000 mg/l]	Chloride[320.000 mg/l],pH[7.900 pH],TDS[1030.000 mg/l],Alkalinity[380.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[81.700 mg/l],Calcium[64.000 mg/l],Magnesium[38.400 mg/l],Hardness[320.000 mg/l]	L0026473753	HabsId : 0000882804	25.763093	74.74473
50	BARANTIYA	Barantiya	Barandhiya	GPS Luna Ka Khera/ Scheme Name: Jalmani Hurda,/SC2395357	Shallow Tubewell	District PHED Lab Bhilwara	05/02/2021	Fluoride[3.300 mg/l],Nitrate[123.000 mg/l],TDS[2810.000 mg/l]	Chloride[1000.000 mg/l],pH[8.200 pH],Alkalinity[530.000 mg/l]	Magnesium[127.200 mg/l],Hardness[1020.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[259.000 mg/l],Calcium[196.000 mg/l]	L0036117383	HabsId : 0000882804	25.755109	74.749457
51	BARANTIYA	Barantiya	Barandhiya	GPS/ Scheme Name: Jalmani Hurda,/SC2395358	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[1.700 mg/l],TDS[2460.000 mg/l]	Nitrate[41.000 mg/l],Chloride[910.000 mg/l],pH[8.200 pH],Alkalinity[390.000 mg/l]	Magnesium[110.400 mg/l],Hardness[760.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.800 NTU],Sulphates[221.000 mg/l],Calcium[120.000 mg/l]	L0036009578	HabsId : 0000882804	25.759982	74.744116
52	BARANTIYA	Barantiya	Barandhiya	GSS/ Scheme Name: Jalmani Hurda,/SC2395359	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[3.200 mg/l],Chloride[1100.000 mg/l],Nitrate[125.000 mg/l],TDS[2850.000 mg/l]	pH[8.200 pH],Alkalinity[420.000 mg/l]	Magnesium[132.000 mg/l],Hardness[1040.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[287.000 mg/l],Calcium[196.000 mg/l]	L0036009623	HabsId : 0000882804	25.762934	74.742882
53	BARANTIYA	BARANTIYA	DOLATPURA (Luna ka kheda)	DHOLA KE PAS,/PU0002025055	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[2.400 mg/l],TDS[2370.000 mg/l]	Nitrate[33.000 mg/l],Chloride[860.000 mg/l],pH[8.200 pH],Alkalinity[400.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[180.000 mg/l],Calcium[74.400 mg/l],Magnesium[47.520 mg/l],Hardness[384.000 mg/l]	L0022260183	HabsId : 0000882806	25.756745	74.748263
				Bheel Mohalla/ Scheme Name: Ladpura,/SC3164195	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[4.000 mg/l],Alkalinity[670.000 mg/l]	Nitrate[3.770 mg/l],Chloride[220.000 mg/l],pH[8.500 pH],TDS[1710.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[9.200 mg/l],Calcium[16.000 mg/l],Magnesium[25.200 mg/l],Hardness[145.000 mg/l]	L0021387224	HabsId : 0000882805		

54	BARANTIYA	BARANTIYA	LADPURA	Bheel Mohalla/ Scheme Name: Ladpura,/SC3164195	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[10.000 mg/l]	Nitrate[9.000 mg/l],Chloride[140.000 mg/l],pH[7.900 pH],TDS[1310.000 mg/l],Alkalinity[370.000 mg/l]	Sulphates[1710.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[24.000 mg/l],Magnesium[60.000 mg/l],Hardness[240.000 mg/l]	L0026475265	HabsId : 0000882805	25.761331	74.741968
				Bheel Mohalla/ Scheme Name: Ladpura,/SC3164195	Shallow Tubewell	District PHED Lab Bhilwara	04/09/2020	Fluoride[5.100 mg/l],Nitrate[144.000 mg/l],TDS[2550.000 mg/l],Alkalinity[720.000 mg/l]	Chloride[790.000 mg/l],pH[8.300 pH]	Hardness[680.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.800 NTU],Sulphates[248.000 mg/l],Calcium[116.000 mg/l],Magnesium[93.600 mg/l]	L0033844133	HabsId : 0000882805		
55.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	HP NR PATHWARI,/PU0000384653	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[6.500 mg/l]	Nitrate[14.000 mg/l],Chloride[660.000 mg/l],pH[7.800 pH],TDS[1850.000 mg/l],Alkalinity[400.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[186.000 mg/l],Calcium[16.000 mg/l],Magnesium[26.400 mg/l],Hardness[150.000 mg/l]	L0022636709	HabsId : 0000882807	25.780991	74.750050°
56.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	HP NR DAIRY,/PU0001112800	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[6.900 mg/l]	Nitrate[13.000 mg/l],Chloride[170.000 mg/l],pH[7.600 pH],TDS[840.000 mg/l],Alkalinity[390.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[198.000 mg/l],Calcium[12.000 mg/l],Magnesium[7.200 mg/l],Hardness[60.000 mg/l]	L0022636688	HabsId : 0000882807	25.780824	74.748004
57.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	HP NR BALAJI,/PU0001112801	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[1.900 mg/l]	Nitrate[22.000 mg/l],Chloride[820.000 mg/l],pH[8.000 pH],TDS[1880.000 mg/l],Alkalinity[160.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[214.000 mg/l],Calcium[72.000 mg/l],Magnesium[72.000 mg/l],Hardness[480.000 mg/l]	L0022636664	HabsId : 0000882807	25.779338	74.749975
58.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	HP NR SCHOOL,/PU0001112803	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[2.000 mg/l]	Nitrate[13.000 mg/l],Chloride[60.000 mg/l],pH[7.900 pH],TDS[350.000 mg/l],Alkalinity[200.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[20.200 mg/l],Calcium[8.000 mg/l],Magnesium[16.800 mg/l],Hardness[90.000 mg/l]	L0022636641	HabsId : 0000882807	25.780915	74.746848
59.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	POLU BHEEL KE PAS/ Scheme Name: LAMBA-HP,/SC5445208	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[5.000 mg/l],Nitrate[49.200 mg/l],TDS[2370.000 mg/l],Alkalinity[890.000 mg/l]	Chloride[400.000 mg/l],pH[8.200 pH]		Total Coliform[0.000 MPN/100ml],Sulphates[80.000 mg/l],Calcium[14.400 mg/l],Magnesium[48.000 mg/l],Hardness[236.000 mg/l]	L0021387307	HabsId : 0000882807	25.782094	74.744479
				BHILO KA KHERA/ Scheme Name: LAMBA-HP,/SC5445205	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017		Nitrate[17.000 mg/l],Fluoride[1.300 mg/l],Chloride[270.000 mg/l],pH[7.800 pH],TDS[700.000 mg/l],Alkalinity[230.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[98.300 mg/l],Calcium[16.000 mg/l],Magnesium[21.600 mg/l],Hardness[130.000 mg/l]	L0022636581	HabsId : 0000882807		
				POLU BHEEL KE PAS/ Scheme Name: LAMBA-HP,/SC5445208	Shallow Tubewell	District PHED Lab Bhilwara	28/03/2019	Fluoride[5.400 mg/l]	Nitrate[39.000 mg/l],Chloride[490.000 mg/l],pH[7.900 pH],TDS[1460.000 mg/l],Alkalinity[390.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[161.000 mg/l],Calcium[64.000 mg/l],Magnesium[19.200 mg/l],Hardness[240.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028554721	HabsId : 0000882807		
				POLU BHEEL KE PAS/ Scheme Name: LAMBA-HP,/SC5445208	Shallow Tubewell	District PHED Lab Bhilwara	07/01/2021	Chloride[3000.000 mg/l],Nitrate[66.000 mg/l],TDS[7650.000 mg/l]	Fluoride[1.000 mg/l],pH[7.700 pH],Alkalinity[220.000 mg/l]	Sulphates[519.000 mg/l],Calcium[800.000 mg/l],Magnesium[408.000 mg/l],Hardness[3700.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.400 NTU]	L0035477365	HabsId : 0000882807		

60.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	NR BUS STEND/ Scheme Name: LAMBA-HP,/SC5445209	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[5.500 mg/l]	Nitrate[13.000 mg/l],Chloride[200.000 mg/l],pH[7.300 pH],TDS[920.000 mg/l],Alkalinity[480.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[76.700 mg/l],Calcium[8.000 mg/l],Magnesium[4.800 mg/l],Hardness[40.000 mg/l]	L0022636613	HabsId : 0000882807	25.78251	74.740667
				NR BUS STEND/ Scheme Name: LAMBA-HP,/SC5445209	Shallow Tubewell	District PHED Lab Bhilwara	11/05/2020	Fluoride[5.200 mg/l],Nitrate[238.000 mg/l],TDS[3120.000 mg/l],Alkalinity[870.000 mg/l]	Chloride[910.000 mg/l],pH[8.400 pH]	Hardness[660.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[320.000 mg/l],Calcium[112.000 mg/l],Magnesium[91.200 mg/l]	L0034055594	HabsId : 0000882807		
				NR ROAD IN KHERA/ Scheme Name: LAMBA-HP,/SC5445206	Shallow Tubewell	District PHED Lab Bhilwara	18/12/2020	Fluoride[3.300 mg/l],Nitrate[129.000 mg/l],TDS[2730.000 mg/l]	Chloride[1000.000 mg/l],pH[8.200 pH],Alkalinity[440.000 mg/l]	Magnesium[139.200 mg/l],Hardness[1030.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.500 NTU],Sulphates[281.000 mg/l],Calcium[180.000 mg/l]	L0035216424	HabsId : 0000882807		
				NR BUS STEND/ Scheme Name: LAMBA-HP,/SC5445209	Shallow Tubewell	District PHED Lab Bhilwara	05/02/2021	Fluoride[3.400 mg/l],Chloride[1200.000 mg/l],TDS[2950.000 mg/l]	Nitrate[44.000 mg/l],pH[8.200 pH],Alkalinity[510.000 mg/l]	Calcium[204.000 mg/l],Magnesium[103.200 mg/l],Hardness[940.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.400 NTU],Sulphates[227.000 mg/l]	L0036117437	HabsId : 0000882807		
61.0	BARANTIYA	URJA KA KHERA	URJA KA KHERA	Govt. Primary School/ Scheme Name: Jalmani Hurda,/H2927441	Delivery Point	District PHED Lab Bhilwara	28/03/2019	Fluoride[4.400 mg/l],Nitrate[49.000 mg/l],TDS[2500.000 mg/l]	Chloride[900.000 mg/l],pH[7.400 pH],Alkalinity[210.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[207.000 mg/l],Calcium[92.000 mg/l],Magnesium[86.400 mg/l],Hardness[590.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028554724	HabsId : 0000882807	25.78201	74.750377
				GPS KESARPURA/ Scheme Name: Jalmani Hurda,/SC1752107	Shallow Tubewell	District PHED Lab Bhilwara	07/01/2021	Fluoride[3.400 mg/l]	Nitrate[7.200 mg/l],Chloride[140.000 mg/l],pH[8.400 pH],TDS[760.000 mg/l],Alkalinity[500.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.200 NTU],Sulphates[48.000 mg/l],Calcium[24.000 mg/l],Magnesium[14.400 mg/l],Hardness[120.000 mg/l]	L0036022636	HabsId : 0000882807		
62.0	KOTRI	KOTRI	KOTRI	Govt. Girls Primary School/ Scheme Name: Jalmani Hurda,/SC1767039	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Nitrate[63.300 mg/l]	Fluoride[0.200 mg/l],Chloride[190.000 mg/l],pH[7.800 pH],TDS[1124.000 mg/l],Alkalinity[350.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[101.000 mg/l],Calcium[71.600 mg/l],Magnesium[54.000 mg/l],Hardness[404.000 mg/l]	L0021479694	HabsId : 0000882764	25.88827	74.737923
63.0	KOTRI	ANANDIPURA	ANANDIPURA	Regar Mohalla/ Scheme Name: Kotri Old HP,/SC5422896	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Chloride[1320.000 mg/l],Nitrate[520.000 mg/l],TDS[4820.000 mg/l]	Fluoride[0.200 mg/l],pH[7.500 pH],Alkalinity[520.000 mg/l]	Calcium[272.000 mg/l],Magnesium[193.200 mg/l],Hardness[1485.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[212.000 mg/l]	L0021479620	HabsId : 0000882766	25.907674	74.726947
64.0	Kotri	Anandipura	Anandipura	Govt. Upper Primary School/ Scheme Name: Jalmani Hurda,/SC1767043	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2020	Chloride[1600.000 mg/l],Nitrate[440.000 mg/l],TDS[3920.000 mg/l]	Fluoride[0.450 mg/l],pH[7.800 pH],Alkalinity[460.000 mg/l]	Calcium[608.000 mg/l],Magnesium[232.800 mg/l],Hardness[2490.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.100 NTU],Sulphates[264.000 mg/l]	L0035208126	HabsId : 0000882766	25.907605	74.726477

65.0	Kotri	Anandipura	Anandipura	Jat Mohalla Bad k Neeche/ Scheme Name: Kotri Old HP,/SC5422897	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2020	Chloride[1050.000 mg/l],Nitrate[426.000 mg/l],TDS[2920.000 mg/l]	Fluoride[0.520 mg/l],pH[7.700 pH],Alkalinity[380.000 mg/l]	Calcium[248.000 mg/l],Magnesium[153.600 mg/l],Hardness[1260.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[220.000 mg/l]	L0035208171	HabsId : 0000882766	25.908623	74.726996
66.0	KOTRI	KOTRI	BAGRIYA KA KHERA	HP JAT MOHALLA,/PU0000739075	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[2.800 mg/l],Chloride[3950.000 mg/l],TDS[9180.000 mg/l]	Nitrate[9.500 mg/l],pH[7.300 pH],Alkalinity[360.000 mg/l]	Magnesium[535.200 mg/l],Hardness[2650.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[302.000 mg/l],Calcium[168.000 mg/l]	L0022794502	HabsId : 0000882765	25.888829	74.746838
67.0	KOTRI	LACHHMIPURA	LAXMIPURA	Regar mohlla/ Scheme Name: SC Basti Hurda,/SC5206290	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Nitrate[206.000 mg/l],TDS[2920.000 mg/l],Alkalinity[630.000 mg/l]	Fluoride[0.200 mg/l],Chloride[800.000 mg/l],pH[7.900 pH]	Hardness[605.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[212.000 mg/l],Calcium[115.200 mg/l],Magnesium[76.080 mg/l]	L0022794566	HabsId : 0000882767	25.894947	74.721272
				Regar mohlla/ Scheme Name: SC Basti Hurda,/SC5206290	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2020	Nitrate[53.000 mg/l]	Fluoride[1.200 mg/l],Chloride[300.000 mg/l],pH[8.100 pH],TDS[1290.000 mg/l],Alkalinity[600.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[92.000 mg/l],Calcium[88.000 mg/l],Magnesium[64.800 mg/l],Hardness[490.000 mg/l]	L0035208302	HabsId : 0000882767		
68.0	KOTRI	LACHHMIPURA	NAYA LAXMIPURA	MATAJI KA STHAN 1/ Scheme Name: KOTRI-HP,/SC5443296	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[3.500 mg/l],Chloride[3000.000 mg/l],TDS[8300.000 mg/l]	Nitrate[10.600 mg/l],pH[8.000 pH],Alkalinity[590.000 mg/l]	Sulphates[516.000 mg/l],Magnesium[147.400 mg/l],Hardness[872.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[103.200 mg/l]	L0021479730	HabsId : 0000882768	25.886128	74.719153
69.0	Kotri	Lachhmipura	Laxmipura	AANDIPURA RASTA/ Scheme Name: KOTRI-HP,/SC5443293	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2020	Nitrate[106.000 mg/l]	Fluoride[1.000 mg/l],Chloride[400.000 mg/l],pH[8.000 pH],TDS[1380.000 mg/l],Alkalinity[490.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Sulphates[80.000 mg/l],Calcium[52.000 mg/l],Magnesium[52.800 mg/l],Hardness[350.000 mg/l]	L0035208242	HabsId : 0000882767	25.895842	74.721078
70.0	BHOJRAS	BALWANTPURA	BALWANTPURA	AGANWADI CENTER,/PU0002025768	Shallow Tubewell	District PHED Lab Bhilwara	08/05/2017	Fluoride[2.400 mg/l],Nitrate[183.000 mg/l],TDS[2620.000 mg/l],Alkalinity[760.000 mg/l]	Chloride[800.000 mg/l],pH[8.400 pH]		Total Coliform[0.000 MPN/100ml],Sulphates[218.000 mg/l],Calcium[67.600 mg/l],Magnesium[60.720 mg/l],Hardness[322.000 mg/l]	L0022260385	HabsId : 0000882822	25.772225	74.660485
				AGANWADI CENTER,/PU0002025727	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[4.300 mg/l],Nitrate[92.000 mg/l]	Chloride[630.000 mg/l],pH[7.900 pH],TDS[1850.000 mg/l],Alkalinity[500.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[5.510 mg/l],Calcium[68.000 mg/l],Magnesium[31.200 mg/l],Hardness[310.000 mg/l]	L0026475653	HabsId : 0000882823		
71.0	BHOJRAS	BALWANTPURA	BALWANTPURA	HP GPS,/PU0001112883	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[6.000 mg/l],Nitrate[77.000 mg/l],Alkalinity[730.000 mg/l]	Chloride[600.000 mg/l],pH[7.900 pH],TDS[1970.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[400.000 mg/l],Calcium[64.000 mg/l],Magnesium[36.000 mg/l],Hardness[300.000 mg/l]	L0026475604	HabsId : 0000882822	25.772131	74.660358
72.0	BHOJRAS	BALWANTPURA	BALWANTPURA	SHAMSAN GHAT,/PU0002025757	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[2.200 mg/l],Chloride[1490.000 mg/l],Nitrate[338.000 mg/l],TDS[4370.000 mg/l],Alkalinity[840.000 mg/l]	pH[7.500 pH]	Calcium[212.000 mg/l],Magnesium[172.800 mg/l],Hardness[1250.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[176.000 mg/l]	L0026475583	HabsId : 0000882822	25.773343	74.664356

73.0	BHOJRAS	CHAINPURIYA	CHAINPURIYA	HP NR SCHOOL,/PU0000374439	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Nitrate[125.000 mg/l]	Fluoride[1.400 mg/l],Chloride[300.000 mg/l],pH[8.200 pH],TDS[1250.000 mg/l],Alkalinity[310.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[180.000 mg/l],Calcium[36.000 mg/l],Magnesium[16.800 mg/l],Hardness[160.000 mg/l]	L0022636973	HabsId : 0000882826	25.776832	74.698767
				HP GPS,/PU0001095303	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[2.100 mg/l],Nitrate[66.000 mg/l]	Chloride[200.000 mg/l],pH[8.200 pH],TDS[940.000 mg/l],Alkalinity[440.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[66.100 mg/l],Calcium[48.000 mg/l],Magnesium[19.200 mg/l],Hardness[200.000 mg/l]	L0026475898	HabsId : 0000882826		
				HP GPS,/PU0001095303	Shallow Tubewell	District PHED Lab Bhilwara	11/05/2020	Fluoride[5.500 mg/l],Nitrate[102.000 mg/l],TDS[2420.000 mg/l],Alkalinity[780.000 mg/l]	Chloride[700.000 mg/l],pH[7.800 pH]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[149.000 mg/l],Calcium[68.000 mg/l],Magnesium[52.800 mg/l],Hardness[390.000 mg/l]	L0034055987	HabsId : 0000882826		
74.0	BHOJRAS	Chainpuriya	Chainpuriya	BARWA BASTI,/PU0002025397	Shallow Tubewell	District PHED Lab Bhilwara	11/05/2020	Fluoride[5.300 mg/l],Nitrate[110.000 mg/l],TDS[2320.000 mg/l],Alkalinity[730.000 mg/l]	Chloride[650.000 mg/l],pH[7.500 pH]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[188.000 mg/l],Calcium[60.000 mg/l],Magnesium[62.400 mg/l],Hardness[410.000 mg/l]	L0034055926	HabsId : 0000882826	25.776633	74.699653
75.0	BHOJRAS	Chainpuriya	Chainpuriya	Shamshan Ghat/ Scheme Name: Chainpuriya,/SC3070042	Shallow Tubewell	District PHED Lab Bhilwara	11/05/2020	Fluoride[3.600 mg/l],Nitrate[73.000 mg/l]	Chloride[620.000 mg/l],pH[8.500 pH],TDS[1980.000 mg/l],Alkalinity[590.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.600 NTU],Sulphates[175.000 mg/l],Calcium[68.000 mg/l],Magnesium[72.000 mg/l],Hardness[470.000 mg/l]	L0034056087	HabsId : 0000882826	25.779854	74.700774
76.0	BHOJRAS	CHAINPURIYA	SURAJPURA	HP GPS,/PU0001095303	Shallow Tubewell	District PHED Lab Bhilwara	19/12/2017	Fluoride[8.400 mg/l],Alkalinity[610.000 mg/l]	Nitrate[17.000 mg/l],Chloride[120.000 mg/l],pH[8.300 pH],TDS[880.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[73.500 mg/l],Calcium[12.000 mg/l],Magnesium[9.600 mg/l],Hardness[70.000 mg/l]	L0022636951	HabsId : 0000882826	25.774987	74.707512
				Govt. Primary School/ Scheme Name: Jalmani Hurda,/SC1767027	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[9.500 mg/l],Alkalinity[610.000 mg/l]	Nitrate[10.000 mg/l],Chloride[290.000 mg/l],pH[8.000 pH],TDS[1160.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[15.600 mg/l],Calcium[40.000 mg/l],Magnesium[40.800 mg/l],Hardness[270.000 mg/l]	L0026475980	HabsId : 0000882827		
77.0	BHOJRAS	CHAINPURIYA	SURAJPURA	HP REGAR MOHALLA,/PU0001095305	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[5.500 mg/l],Nitrate[105.000 mg/l],Alkalinity[730.000 mg/l]	Chloride[580.000 mg/l],pH[8.100 pH],TDS[1820.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[55.100 mg/l],Calcium[44.000 mg/l],Magnesium[48.000 mg/l],Hardness[310.000 mg/l]	L0026475998	HabsId : 0000882827	25.774453	74.706387
78.0	BHOJRAS	LACHHMANPURA	LAXMANPURA	HP SCHOOL,/PU0000374442	Shallow Tubewell	District PHED Lab Bhilwara	15/12/2017	Fluoride[4.400 mg/l]	Nitrate[31.000 mg/l],Chloride[200.000 mg/l],pH[7.800 pH],TDS[1000.000 mg/l],Alkalinity[480.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[108.000 mg/l],Calcium[12.000 mg/l],Magnesium[12.000 mg/l],Hardness[80.000 mg/l]	L0022637035	HabsId : 0000882824	25.763908	74.696838
79.0	BHOJRAS	LACHHMANPURA	LAXMANPURA	HP BHEEL MOHALLA,/PU0001112890	Shallow Tubewell	District PHED Lab Bhilwara	15/12/2017	Chloride[1140.000 mg/l],Nitrate[261.000 mg/l],TDS[2600.000 mg/l]	Fluoride[1.500 mg/l],pH[7.800 pH],Alkalinity[320.000 mg/l]	Magnesium[100.800 mg/l],Hardness[630.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[256.000 mg/l],Calcium[84.000 mg/l]	L0022637010	HabsId : 0000882824	25.762307	74.694731
80.0				HP BHEEL MOHALLA,/PU0001112890	Shallow Tubewell	District PHED Lab Bhilwara	17/06/2018	Fluoride[2.400 mg/l],Nitrate[250.000 mg/l]	Chloride[510.000 mg/l],pH[8.100 pH],TDS[1940.000 mg/l],Alkalinity[550.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[140.000 mg/l],Calcium[96.000 mg/l],Magnesium[86.400 mg/l],Hardness[600.000 mg/l]	L0026476022	HabsId : 0000882824		

81.0	BARLA	DEOPURA	DEVPURA	HP NR POND,/PU0000374433	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018		Nitrate[18.000 mg/l],Fluoride[0.900 mg/l],Chloride[300.000 mg/l],pH[8.100 pH],TDS[1155.000 mg/l],Alkalinity[430.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[212.000 mg/l],Calcium[152.000 mg/l],Magnesium[33.600 mg/l],Hardness[520.000 mg/l]	L0024111929	HabsId : 0000882795	25.829687	74.69228
82.0	BARLA	DEOPURA	DEVPURA	AGUCHA ROAD,/PU0000556509	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[8.700 mg/l],Nitrate[64.000 mg/l]	Chloride[440.000 mg/l],pH[8.500 pH],TDS[1690.000 mg/l],Alkalinity[590.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[181.000 mg/l],Calcium[12.000 mg/l],Magnesium[58.800 mg/l],Hardness[275.000 mg/l]	L0021387391	HabsId : 0000882795	25.83939	74.68977
				AGUCHA ROAD,/PU0000556509	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018		Nitrate[2.000 mg/l],Fluoride[0.800 mg/l],Chloride[240.000 mg/l],pH[8.300 pH],TDS[845.000 mg/l],Alkalinity[400.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[106.000 mg/l],Calcium[28.000 mg/l],Magnesium[28.800 mg/l],Hardness[190.000 mg/l]	L0024111448	HabsId : 0000882795		
83.0	BARLA	DEOPURA	DEVPURA	HP KHATI MOHALLA,/PU0001112811	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018	Fluoride[2.400 mg/l],Chloride[1290.000 mg/l],Nitrate[145.000 mg/l],TDS[3660.000 mg/l],Alkalinity[620.000 mg/l]	pH[7.800 pH]	Sulphates[1000.000 mg/l],Calcium[236.000 mg/l],Magnesium[146.400 mg/l],Hardness[1200.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0024111511	HabsId : 0000882795	25.833413	74.692194
84.0	BARLA	DEOPURA	DEVPURA	DEVNARAYAN KE PAS,/PU0002025184	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018	Fluoride[5.000 mg/l],Nitrate[69.000 mg/l],TDS[3000.000 mg/l]	Chloride[970.000 mg/l],pH[7.900 pH],Alkalinity[570.000 mg/l]	Sulphates[670.000 mg/l],Hardness[670.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[108.000 mg/l],Magnesium[96.000 mg/l]	L0024111552	HabsId : 0000882795	25.832812	74.697551
85.0	BARLA	DEOPURA	DEVPURA	Govt. praimary school/ Scheme Name: Jalmani Hurda,/SC1752117	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018	Fluoride[2.000 mg/l],Chloride[3500.000 mg/l],Nitrate[208.000 mg/l],TDS[8270.000 mg/l],Alkalinity[1060.000 mg/l]	pH[7.800 pH]	Sulphates[1510.000 mg/l],Calcium[536.000 mg/l],Magnesium[372.000 mg/l],Hardness[2890.000 mg/l]	Total Coliform[0.000 MPN/100ml]	L0024111480	HabsId : 0000882795	25.83259	74.693933
86.0	BARLA	GAJSINGHPURA	GAJSINGH PURA	KUI KE PAS,/PU0002025127	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018	Fluoride[4.400 mg/l]	Nitrate[22.000 mg/l],Chloride[300.000 mg/l],pH[7.700 pH],TDS[1380.000 mg/l],Alkalinity[350.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[81.700 mg/l],Calcium[40.000 mg/l],Magnesium[33.600 mg/l],Hardness[240.000 mg/l]	L0024113879	HabsId : 0000882793	25.816001	74.692861
87.0	BARLA	GAJSINGHPURA	GAJSINGH PURA	Govt. primary school/ Scheme Name: Jalmani Hurda,/SC1752118	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017		Nitrate[26.200 mg/l],Fluoride[1.100 mg/l],Chloride[610.000 mg/l],pH[8.500 pH],TDS[1570.000 mg/l],Alkalinity[420.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[150.000 mg/l],Calcium[16.000 mg/l],Magnesium[57.600 mg/l],Hardness[280.000 mg/l]	L0021387452	HabsId : 0000882793	25.816292	74.692866
				Govt. primary school/ Scheme Name: Jalmani Hurda,/SC1752118	Shallow Tubewell	District PHED Lab Bhilwara	09/02/2018	Fluoride[6.000 mg/l],Alkalinity[870.000 mg/l]	Nitrate[37.000 mg/l],Chloride[570.000 mg/l],pH[8.200 pH],TDS[1930.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[209.000 mg/l],Calcium[48.000 mg/l],Magnesium[60.000 mg/l],Hardness[370.000 mg/l]	L0024112045	HabsId : 0000882793		
88.0	BARLA	JAISINGHPURA	JAISINGHPURA	HP RAJPOOT BASTI,/PU0001112878	Shallow Tubewell	District PHED Lab Bhilwara	26/09/2017	Fluoride[5.200 mg/l],Nitrate[123.000 mg/l],TDS[2230.000 mg/l],Alkalinity[770.000 mg/l]	Chloride[770.000 mg/l],pH[7.300 pH]		Total Coliform[0.000 MPN/100ml],Calcium[80.000 mg/l],Magnesium[56.640 mg/l],Hardness[436.000 mg/l]	L0022954947	HabsId : 0000882794	25.804756	74.686522

89.0	BARLA	SULTANPURA	SULTANPURA	MATA JI KE MANDIR,/PU0002025078	Shallow Tubewell	District PHED Lab Bhilwara	12/02/2018	Fluoride[3.500 mg/l],Chloride[2600.000 mg/l],TDS[6280.000 mg/l],Alkalinity[740.000 mg/l]	Nitrate[6.000 mg/l],pH[7.900 pH]	Calcium[264.000 mg/l],Magnesium[168.000 mg/l],Hardness[1360.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[177.000 mg/l]	L0024114763	HabsId : 0000882792	25.813533	74.676904
90.0	BARLA	SULTANPURA	SULTANPURA	DEVNARAYAN KE PAS,/PU0002025084	Shallow Tubewell	District PHED Lab Bhilwara	26/09/2017		Nitrate[30.000 mg/l],Fluoride[1.200 mg/l],Chloride[200.000 mg/l],pH[8.200 pH],TDS[1000.000 mg/l],Alkalinity[580.000 mg/l]		Total Coliform[0.000 MPN/100ml],Calcium[20.000 mg/l],Magnesium[22.800 mg/l],Hardness[145.000 mg/l]	L0022954984	HabsId : 0000882792	25.828589	74.679244
				DEVNARAYAN KE PAS,/PU0002025084	Shallow Tubewell	District PHED Lab Bhilwara	12/02/2018	Fluoride[2.400 mg/l]	Nitrate[8.800 mg/l],Chloride[120.000 mg/l],pH[8.200 pH],TDS[500.000 mg/l],Alkalinity[220.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[91.800 mg/l],Calcium[28.000 mg/l],Magnesium[19.200 mg/l],Hardness[150.000 mg/l]	L0024114808	HabsId : 0000882792		
91.0	BARLA	SULTANPURA	SULTANPURA	GPS SULTANPURA/ Scheme Name: Jalmani Hurda,/SC1752120	Shallow Tubewell	District PHED Lab Bhilwara	12/02/2018	Fluoride[1.900 mg/l]	Nitrate[5.000 mg/l],Chloride[100.000 mg/l],pH[8.200 pH],TDS[580.000 mg/l],Alkalinity[300.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[68.000 mg/l],Calcium[52.000 mg/l],Magnesium[14.400 mg/l],Hardness[190.000 mg/l]	L0024114529	HabsId : 0000882792	25.815714	74.676883
92.0	BARLA	SULTANPURA	SULTANPURA	Near Mansi river/ Scheme Name: Sultanpura,/SC5369133	Shallow Tubewell	District PHED Lab Bhilwara	12/02/2018	Fluoride[4.000 mg/l]	Nitrate[11.000 mg/l],Chloride[120.000 mg/l],pH[8.400 pH],TDS[620.000 mg/l],Alkalinity[380.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[37.700 mg/l],Calcium[32.000 mg/l],Magnesium[7.200 mg/l],Hardness[110.000 mg/l]	L0024114579	HabsId : 0000882792	25.822523	74.67813
93.0	HURDA	HURDA MAGRA	HURDA MANGRA	HP REGAR BASTI SHAHPURA ROAD,/PU0001095326	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[3.600 mg/l],Chloride[1060.000 mg/l],TDS[4920.000 mg/l],Alkalinity[1450.000 mg/l]	Nitrate[24.000 mg/l],pH[8.000 pH]	Sulphates[614.000 mg/l],Hardness[609.000 mg/l]	Total Coliform[0.000 MPN/100ml],Calcium[128.000 mg/l],Magnesium[93.360 mg/l]	L0022260787	HabsId : 0000882763	25.897337	74.689032
94.0	HURDA	HURDA SEJA	HURDA	HP BUS STAND ,/PU0000384658	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Fluoride[2.200 mg/l],Nitrate[49.000 mg/l]	Chloride[550.000 mg/l],pH[8.200 pH],TDS[1214.000 mg/l],Alkalinity[330.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[159.000 mg/l],Calcium[28.000 mg/l],Magnesium[57.600 mg/l],Hardness[310.000 mg/l]	L0021416231	HabsId : 0000882759	25.90061	74.683275
95.0	HURDA	HURDA SEJA	HURDA	OW NO 14,/PU0000384665	Openwell	District PHED Lab Bhilwara	19/12/2017		Nitrate[27.000 mg/l],Fluoride[0.600 mg/l],Chloride[80.000 mg/l],pH[8.300 pH],TDS[340.000 mg/l],Alkalinity[140.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[4.590 mg/l],Calcium[28.000 mg/l],Magnesium[2.400 mg/l],Hardness[80.000 mg/l]	L0022637123	HabsId : 0000882759	25.917837	74.685235
				OW NO 14,/PU0000384665	Openwell	District PHED Lab Bhilwara	24/04/2018		Nitrate[17.000 mg/l],Fluoride[0.300 mg/l],Chloride[210.000 mg/l],pH[7.900 pH],TDS[660.000 mg/l],Alkalinity[140.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[48.000 mg/l],Magnesium[48.000 mg/l],Hardness[320.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028086394	HabsId : 0000882759		
				OW NO 14,/PU0000384665	Openwell	District PHED Lab Bhilwara	24/05/2018		Nitrate[19.000 mg/l],Fluoride[0.500 mg/l],Chloride[230.000 mg/l],pH[7.500 pH],TDS[710.000 mg/l],Alkalinity[130.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[60.000 mg/l],Magnesium[24.000 mg/l],Hardness[250.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028086409	HabsId : 0000882759		

				OW NO 14,/PU0000384665	Openwell	District PHED Lab Bhilwara	16/08/2018		Nitrate[15.000 mg/l],Fluoride[0.300 mg/l],Chloride[370.000 mg/l],pH[7.400 pH],TDS[1090.000 mg/l],Alkalinity[140.000 mg/l]		E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[84.000 mg/l],Magnesium[60.480 mg/l],Hardness[462.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028086432	HabsId : 0000882759		
96.0	HURDA	HURDA SEJA	HURDA	OW NO 15,/PU0002026930	Openwell	District PHED Lab Bhilwara	19/12/2017		Nitrate[17.000 mg/l],Fluoride[0.500 mg/l],Chloride[80.000 mg/l],pH[8.500 pH],TDS[260.000 mg/l],Alkalinity[130.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[1.840 mg/l],Calcium[40.000 mg/l],Magnesium[2.400 mg/l],Hardness[110.000 mg/l]	L0022637143	HabsId : 0000882759	25.919263	74.682788
				OW NO 15,/PU0002026930	Openwell	District PHED Lab Bhilwara	24/04/2018		Nitrate[27.000 mg/l],Fluoride[0.200 mg/l],Chloride[620.000 mg/l],pH[7.700 pH],TDS[1610.000 mg/l],Alkalinity[240.000 mg/l]	Magnesium[120.000 mg/l],Hardness[760.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[104.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028086398	HabsId : 0000882759		
				OW NO 15,/PU0002026930	Openwell	District PHED Lab Bhilwara	24/05/2018		Nitrate[41.000 mg/l],Fluoride[0.300 mg/l],Chloride[700.000 mg/l],pH[7.100 pH],TDS[1910.000 mg/l],Alkalinity[220.000 mg/l]	Hardness[650.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[100.000 mg/l],Magnesium[96.000 mg/l],Residual Chlorine[0.000 mg/l]	L0028086405	HabsId : 0000882759		
				OW NO 15,/PU0002026930	Openwell	District PHED Lab Bhilwara	16/08/2018	TDS[2040.000 mg/l]	Nitrate[23.000 mg/l],Fluoride[0.200 mg/l],Chloride[670.000 mg/l],pH[7.200 pH],Alkalinity[240.000 mg/l]	Hardness[883.000 mg/l]	E.Coli[0.000 MPN/100ml],Total Coliform[0.000 MPN/100ml],Turbidity[0.000 NTU],Calcium[176.000 mg/l],Magnesium[38.400 mg/l],Residual Chlorine[0.000 mg/l]	L0028086429	HabsId : 0000882759		
97.0	HURDA	HURDA SEJA	HURDA	OW NO 7,/PU0002026942	Openwell	District PHED Lab Bhilwara	19/12/2017		Nitrate[21.000 mg/l],Fluoride[0.300 mg/l],Chloride[120.000 mg/l],pH[7.900 pH],TDS[395.000 mg/l],Alkalinity[140.000 mg/l]		Total Coliform[0.000 MPN/100ml],Sulphates[24.800 mg/l],Calcium[60.000 mg/l],Magnesium[7.200 mg/l],Hardness[180.000 mg/l]	L0022637164	HabsId : 0000882759	25.917106	74.691496
98.0	HURDA	HURDA SEJA	KHATI KHERA	GPS HURDA/ Scheme Name: Jalmani Hurda,/SC1767034	Shallow Tubewell	District PHED Lab Bhilwara	05/05/2017	Chloride[1330.000 mg/l],Nitrate[378.000 mg/l],TDS[4320.000 mg/l]	Fluoride[0.200 mg/l],pH[7.400 pH],Alkalinity[340.000 mg/l]	Calcium[678.400 mg/l],Hardness[2026.000 mg/l]	Total Coliform[0.000 MPN/100ml],Sulphates[218.000 mg/l],Magnesium[79.200 mg/l]	L0021416462	HabsId : 0000882761	25.908807	74.710395

Annexure-XVI

FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20702**
Report On : **06/08/2021**

I hereby certify that I **Sheeba**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **15/07/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **Open Well in agriculture land of Bhawani Shankar Mali , Village- Araniya Chauhan , Bhilwara** Collected from **Open Well** Collected on **12/07/2021**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **06/08/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.66
2	Total Suspended Solids mg/l	38
3	Chemical Oxygen Demand (COD) mg/l	49
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	12.1
5	Copper as Cu mg/l	0.005
6	Zinc as Zn mg/l	0.768
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.054
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	1920
13	Sulphate as SO_4 mg/l	633
14	Hardness (Total) as $CaCO_3$ mg/l	876
15	Hardness (Calcium) as $CaCO_3$ mg/l	96
16	Magnesium Hardness as $CaCO_3$ mg/l	780
17	Calcium (Titrimetric) as Ca mg/l	38
18	Magnesium as Mg mg/l	190
19	Fluoride as F mg/l	1.31
20	Total Alkalinity as $CaCO_3$ mg/l	548

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **06/08/2021**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20703**
Report On : **06/08/2021**

I hereby certify that I **Sheeba**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **15/07/2021** from **Mr Hitesh Kumar Upadhyay, JSO, Jaipur ,RSPCB Jaipur** a sample of **Water** of **Open Well in the land of Ram Prasad Mali , Village- Araniya Chauhan , Bhilwara** Collected from **Open Well** Collected on **12/07/2021**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **06/08/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.64
2	Total Suspended Solids mg/l	54
3	Chemical Oxygen Demand (COD) mg/l	11
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	3.9
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.363
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.066
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	2200
13	Sulphate as SO_4 mg/l	1087
14	Hardness (Total) as $CaCO_3$ mg/l	940
15	Hardness (Calcium) as $CaCO_3$ mg/l	148
16	Magnesium Hardness as $CaCO_3$ mg/l	792
17	Calcium (Titrimetric) as Ca mg/l	59
18	Magnesium as Mg mg/l	193
19	Fluoride as F mg/l	1.35
20	Total Alkalinity as $CaCO_3$ mg/l	516

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **06/08/2021**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20704**
Report On : **06/08/2021**

I hereby certify that I **Sheeba**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **15/07/2021** from **Shri Vikas Singh, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **Borewell in the land of Bhawani Shankar Mali , Village- Araniya Chauhan , Bhilwara** Collected from **Borewell** Collected on **12/07/2021**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **06/08/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.56
2	Total Suspended Solids mg/l	76
3	Chemical Oxygen Demand (COD) mg/l	70
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	18.2
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.137
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.210
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	2440
13	Sulphate as SO_4 mg/l	678
14	Hardness (Total) as $CaCO_3$ mg/l	868
15	Hardness (Calcium) as $CaCO_3$ mg/l	76
16	Magnesium Hardness as $CaCO_3$ mg/l	792
17	Calcium (Titrimetric) as Ca mg/l	30
18	Magnesium as Mg mg/l	193
19	Fluoride as F mg/l	1.74
20	Total Alkalinity as $CaCO_3$ mg/l	604

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **06/08/2021**

BOARD ANALYST
Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 24)
Final Report

Report No. : **20705**
Report On : **06/08/2021**

I hereby certify that I **Sheeba**, State Board Analyst duly appointed **under sub Section(3) of Section 53 of the Water (Prevention & Control of Pollution) Act, 1974** received on the **15/07/2021** from **Shri Vikas Singh, JSO, Bhilwara ,RSPCB Bhilwara** a sample of **Water** of **Open Well in the land of Ram Chandra Regar , Near Highway (near Araniya Chauhan Mod) , Bhilwara** Collected from **Open Well** Collected on **12/07/2021**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **06/08/2021** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	pH	7.59
2	Total Suspended Solids mg/l	66
3	Chemical Oxygen Demand (COD) mg/l	44
4	Bio-Chemical Oxygen Demand (BOD) (3days at 27° C) mg/l	11.2
5	Copper as Cu mg/l	Not Traceable
6	Zinc as Zn mg/l	0.111
7	Nickel as Ni mg/l	Not Traceable
8	Lead as Pb mg/l	Not Traceable
9	Total Chromium as Cr mg/l	Not Traceable
10	Iron as Fe mg/l	0.020
11	Cadmium as Cd mg/l	Not Traceable
12	Chloride as Cl mg/l	3280
13	Sulphate as SO_4 mg/l	629
14	Hardness (Total) as $CaCO_3$ mg/l	1036
15	Hardness (Calcium) as $CaCO_3$ mg/l	308
16	Magnesium Hardness as $CaCO_3$ mg/l	728
17	Calcium (Titrimetric) as Ca mg/l	123
18	Magnesium as Mg mg/l	178
19	Fluoride as F mg/l	2.14
20	Total Alkalinity as $CaCO_3$ mg/l	608

The condition of the seals, fastening and container on receipt was as follows : **Intact**
Signed This On **06/08/2021**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

Annexure- XVII

कार्यालय सहायक कृषि अधिकारी, गुलाबपुरा - प्रथम
ग्राम, अंगुया के 4 वर्षों के डाटा के संबंध में (फसलवार) औसत उत्पादन

क्रम स	नाम फसल	वर्ष 2017-18 qt/hq.	वर्ष 2018-19 qt/hq.	वर्ष 2019-20 qt/hq	वर्ष 2020-21 qt/hq	वि.वि
1.	गेहूं	40.5	42.5	48.12	50.6	
2.	जौ	28.5	30.3	31.0	31.5 q'	
3.	चना	9.5 qt	10.0 qt	15 qt	10.62 q.	
4	सरसों	13.5	14.0	15 qt	15.5 q,	
5.	मक्का	25.5	26.0	24.5	27.0 q.	
6	कपास	23.0	24.0	26.5	25.8 q	
7.	उड़द	7.125	7.625	9.5	1.8	Not उड़द व मूंग में वर्ष 2019-20 व 2020-21 में पले औसत व अधिक वर्षा से उत्पादन कम हुआ है
8	मूंग	6.0	6.7.	5.7	5.0	

नोट (1) पानी की जांच परीक्षण रिपोर्ट आपके संलग्न है। पानी लवणीय है सिंचाई की संख्या बढ़ाई जाती।
(2) भूमि भी क्षारीय है रिपोर्ट संलग्न है।

दिनेश कुमार
दिनेश कुमार तोलम्बिया
सहायक कृषि अधिकारी
गुलाबपुरा प्रथम, [illegible]

कार्यालय संयुक्त निदेशक कृषि भीलवाड़ा

मिट्टी परीक्षण प्रयोगशाला, भीलवाड़ा

सेवामें, कृषि पर्यवेक्षक, आंगूचा

क्रमांक दिनांक/ई/S/16

क्रम संख्या	प्र.शा.नं.	काश्तकार का नाम	गांव का नाम	स.कृ.अ. क्षेत्र/पंसं. कलस्टर	फसल व किस्म जिसके लिए सिफारिश चाहिए	सिंचित या असिंचित	खसरा नंबर चक नं.	विश्लेषणात्मक सूचना					सिफारिश प्रति हैक्टेयर				जिप्सम की आवश्यकता टन/हैक्टेयर
								पी.एच.	कंडक्टीविटी मि.मो./सेमी.	जैविक कार्बन प्रतिशत	फॉस्फेट किग्रा. प्रति. है.	पोटाश किग्रा. प्रति.है.	गोबर या कंवरे की खाद गाड़ियों मे	नत्रजन किलो	फॉस्फेट किलो	पोटाश किलो	
						पानी		पानी का विश्लेषण									
1	11	कान्हा की कुई	भैरू खेड़ा	दुरड़ा	पालीका	नहर		पी.एच. 8.3	ई.सी. 2.1	आर.एस.बी. मि.ली.	एस.ए.आर. 6.50						
2	12	जोन मोहम्मद नीलगर	"	"	—			8.3	14.9	मि.ली.	41.3						
3	13	भैरू जी की नाड़ी	"	5	—			8.6	4.2	4.6	33.5						
4	14	रेगरो का कुआं	आंगूचा	5	—			8.1	10.3	मि.ली.	25.5						
5	15	रामदेव गुर्जर	आंगूचा	5	—			7.9	12.5	मि.ली.	38.6						
6	16	सरकारी कुआं	पवत्सामपुरा	5	—			7.6	7.3	मि.ली.	21.2						
7	17	महावीर सोनी	आंगूचा	"	—			8.0	4.8	मि.ली.	10.0						
8	18	देव जी की नाड़ी	आंगूचा	5	—			7.9	3.0	मि.ली.	8.96						
9	19	कान्हा नीलका कुआं	भैरू खेड़ा	"	—			8.7	6.5	6.2	44.6						
10	20	कमकड़ीन-I कुआं	भैरू खेड़ा	"	—			8.5	3.0	2.4	24.0						
11	21	घासी राम मीणा	आंगूचा	5	—			7.4	8.2	मि.ली.	11.2						
12	22	कमकड़ीन-II कुआं	भैरू खेड़ा	"	—			7.7	13.8	मि.ली.	21.9						
13	23	मदन S/o राजू कलाल	आंगूचा	5	—			7.8	9.8	मि.ली.	18.97						

* पानी लवणीय है।
* लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।
* फसलो में सरसो, जौ, गेहूँ बोये।
* जींक 25% अधिक रखें।
* कम्पोस्ट खाद का प्रयोग करें।

* पानी लवणीय व क्षारीय है।
* क्षारीय पानी से सिंचाई करने पर पानी को जिप्सम बेड से गुजारें।
* लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।
* फसलो में सरसो, जौ, गेहूँ बोये।
* जींक 25% अधिक रखें।
* कम्पोस्ट खाद का प्रयोग करें।

दिनांक 19/5/2016

ग्राम पंचायत आगूंचा
पं.स. हरदा (भीलवा

18/5/16

कृषि अनुसंधान अधिकारी (रसा

कार्यालय संयुक्त निदेशक कृषि भीलवाड़ा

मिट्टी परीक्षण प्रयोगशाला, भीलवाड़ा

सेवामें सहायक निदेशक गुलाबपुरा

क्रमांक

दिनांक पानी के नमूने दि. 22.04.2019

क्रम संख्या	प्र.शा.नं.	काश्तकार का नाम	गांव का नाम	स.कृ.अ. क्षेत्र/पं.सं. कलस्टर	फसल व किस्म जिसके लिए सिफारिश चाहिए	सिंचित या असिंचित	खसरा नंबर चक नं.	पी.एच.	कंडक्टीविटी मि. मो./सेमी.	जैविक कार्बन प्रतिशत	फॉस्फेट किग्रा. प्रति. है.	पोटाश किग्रा. प्रति.है.	गोबर या कचरे की खाद गाडियों में	नत्रजन किलो	फॉस्फेट किलो	पोटाश किलो	जिप्सम की आवश्यकता टन/हैक्टेयर	विशेष विवरण
								पानी का विश्लेषण										
								पी.एच.	ई.सी.	आर.एस.सी.	एस.ए.आर.							
1	SP1	लादू / हजारी नायक	खेड़ा पलिला		पानी का नमूना			7.6	10.3	NIL	13.17			WSP1 to WSP-9				
2	SP2	मोहनलाल / नन्दा माली	कल्याणपुरा		—"—			7.3	5.3	1.8	2.04							
3	SP3	रतनलाल / [illegible]	—"—		—"—			7.7	10.1	NIL	22.8			अत्यधिक				
4	SP4	बद्री / रामनाथ नायक	खेड़ा पलिला		—"—			8.3	5.2	10.0	26.5			पानी लवणीय व क्षारीय है।				
5	SP5	पन्ना / प्रताप नायक	—"—		—"—			7.6	7.1	NIL	14.8			क्षारीय पानी से सिंचाई करने पर पानी को जिप्सम बेड से गुजारें।				
6	SP6	देवी / जगदीश बैरवा	कीडिमा		—"—			7.3	7.7	NIL	11.4			लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।				
7	SP7	अर्जुन / मिट्ठू जाट	—"—		—"—			7.7	6.5	NIL	21.2							
8	SP8	रतनलाल / उगमा रैगर	कीडिमा		—"—			7.5	8.0	NIL	15.3							
9	SP9	किशना / हीरा गुर्जर	कालापुरा		—"—			7.4	7.6	NIL	14.78			WSP10 हेतु पानी लवणीय है।				
10	SP10	माधोलाल कीर	—"—		—"—			7.7	1.9	NIL	4.39			लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।				WSP11
11	SP11	जीवन / भैरू गुर्जर	—"—		—"—			7.3	3.5	NIL	11.8							पानी लवणीय व क्षारीय है
12	SP12	भगवान / उगमा गुर्जर	भैरू खेड़ा		—"—			7.1	15.1	NIL	14.86			WSP12 व WSP13				
13	SP13	कैलाश / काना गुर्जर	कालापुरा		—"—			7.0	8.6	NIL	15.64			अत्यधिक पानी लवणीय व क्षारीय है।				

क्षारीय पानी से सिंचाई करने पर पानी को जिप्सम बेड से गुजारें। लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।

कृषि अनुसंधान अधिकारी (रसायन) 22/4/19

मृदा परीक्षण प्रयोगशाला, भीलवाड़ा

कार्यालय संयुक्त निदेशक कृषि भीलवाड़ा

सेवामें..... सहायक निदेशक कृषि
उदाकपुरा

कमांक

दिनांक 22.4.2013

क्रम संख्या	प्र.शा.नं.	काश्तकार का नाम	गांव का नाम	स.कृ.अ. क्षेत्र/पं.सं. कलस्टर	फसल व किस्म जिसके लिए सिफारिश चाहिए	सिंचित या असिंचित	खसरा नंबर चक नं.	विश्लेषणात्मक सूचना					सिफारिश प्रति हैक्टेयर				जिप्सम की आवश्यकता टन/हैक्टेयर	विशेष विवरण
								पी.एच.	कंडक्टीविटी मि.मो./सेमी.	जैविक कार्बन प्रतिशत	फॉस्फेट किग्रा. प्रति. है.	पोटाश किग्रा. प्रति.है.	गोबर या कचरे की खाद गाडियों में	नत्रजन किलो	फॉस्फेट किलो	पोटाश किलो		
								पानी का विश्लेषण										
								पी.एच.	ई.सी.	आर.एस.बी.	एस.ए.आर.							
14	SPM	रामधन/मिश्री गुर्जर	मेड़-खेड़ा		पानी मानसून			7.9	10.9	AIC	23.92							
15	SP15	पप्पू/हीरालाल गुर्जर	—		—			7.6	14.3	AIC	28.06							
16	SP16	परशराम/मोहन गुर्जर	दानपुरा		—			7.0	10.6	AIC	21.02							

पानी लवणीय व क्षारीय है।
क्षारीय पानी से सिंचाई करने पर पानी को जिप्सम बेड से गुजारे।
लवणीय पानी से सिंचाई करने पर सिंचाई की संख्या बढ़ावें।

कृषि अनुसंधान अधिकारी (रसायन)
22.4.2013

राजस्थान सरकार
कार्यालय नोडल अधिकारी प्र० श्रे० प० चि० हुरड़ा
क्रमांक/- 98
दिनांक 17-07-2021

श्रीमान क्षेत्रीय अधिकारी
राज्य प्र० नि० म० भीलवाड़ा.

विषयः- HZL रामपुरा आगूचा क्षेत्र में जाँचकमेटी की तथ्यात्मक जांच रिपोर्ट भेजने बाबत

प्रसंगः- आपका पत्रांक .226-2020 दि० 11-7-21 के क्रम में !

आपके उपरोक्त प्रासंगिक पत्र के सम्बन्ध में, एवं श्रीमान संयुक्त निदेशक महो. प० पा० वि० भीलवाड़ा एवं श्रीमान उपखण्ड अधिकारी महो. गुलाबपुरा के प्राप्त निर्देशानुसार 3 सदस्यों की एक जाँच कमेटी गठित की जाकर, HZL रामपुरा आगूचा क्षेत्र में प्रदूषण से पशुओं के स्वास्थ्य पर पड़े दुष्प्रभाव की तथ्यात्मक रिपोर्ट संलग्न कर प्रेषित है।

(डा० सतीश मालवी)

संलग्न
प्रतिलिपिः 99-100 दि. 17/07/21

1. श्रीमान संयुक्त निदेशक महो० प० पा० वि० भीलवाड़ा
2 श्रीमान उपखण्ड अधिकारी जी उपखण्ड कार्या० गुलाबपुरा,

संलग्न —/

Sd
नोडल अधिकारी
प्र. श्रे. पशु चिकित्सालय हुरड़ा (भीलवाड़ा)

पशु पालन विभाग दुरडा जिला भीलवाड़ा

जाँच कमेटी की तथ्यात्मक रिपोर्ट

श्रीमान क्षेत्रीय अधिकारी राजस्थान प्रदूषण नियन्त्रण मण्डल भीलवाड़ा के पंत्रांक राप्रनिमं/भीलवाड़ा/विविध/226-2020/ विशेषन दिनांक 11-7-21 की अनुपालनार्थ-आयोजित मिटिंग में प्राप्त निर्देशानुसार, व श्रीमान उपखण्ड अधिकारीजी, उपखण्ड-गुलाबपुरा के निर्देशन में प्राप्त निर्देशों व श्रीमान संयुक्त निदेशक महो॰ पशुपालन विभाग भीलवाड़ा से प्राप्त 14-07-21 के दूरभाष पर प्राप्त निर्देशों तथा श्रीमान नोडल अधिकारी प्र॰ श्रे॰ प॰चि॰ दुरडा के पत्रांक 92 दिनांक 14-7-21 की अनुपालना में हिन्दुस्थान जिंक लिमिटेड रामपुरा आंगूचा के आस पास के ग्रामों में पशुओं के सम्बन्ध-स्वास्थ्य पर प्रदूषण से कोई-दुष्प्रभाव हुआ या नहीं की जाँच हेतु निम्न सदस्यों की एक जाँच कमेटी का गठन किया गया, जिसमें निम्नसदस्य सम्मिलित

1. डा॰ सतीशमालवी व॰ प॰चि॰अधिकारीरा॰प्र॰ श्रे॰ प॰चि॰ दुरडा।
2. डा॰ जितेन्द्र सिंह — do — do — — do — प्रतापपुरा।
3. डा॰ मुकेश माली प॰चि॰ अधिकारी रा॰ प॰चि॰ रूपाहेली।

जाँच कमेटी में सामिल सदस्यों द्वारा निम्न विभागीय संस्थाओं प्र॰ श्रे॰ पशु चिकित्सालय दुरडा, आंगूचा, प॰चि॰ कोठियां, गाडरों की कोटडी जो कि हिन्दुस्थान जिंक लिमिटेड रामपुरा आंगूचा के आसपास के क्षेत्रों में संचालित है। विगत 01 अप्रेल 2017 से आज दिनांक तक के इन संस्थाओं के आउटडोर के प्रत्येक पृष्ठ की प्रविष्ठीयों का अवलोकन किया गया, साथ ही सम्बन्धित संस्था प्रभारीद्वारा दियेगये प्रमाणपत्रों का जांच कमेटी द्वारा अवलोकन करनें पर निम्न निष्कर्षपर पहुँची।

हिन्दुस्थान जिंक लिमिटेड रामपुरा आँगूचा के आसपास के गाँवो के पशुओं के स्वास्थ्य पर प्रदुषण से होने वाले दुष्प्रभाव का उपरोक्त वर्णित संस्थाओं के आउटडोर पंजिकाओं, व रिकार्ड में कोई इन्द्राज नहीं पाया-गया। साथ ही सम्बन्धित संस्थाओं के संस्था प्रभारियों के पास भी इस-प्रकार का प्रदुषण से पशुओं के स्वास्थ्य पर होने वाले दुष्प्रभाव सम्बन्धी शिकायतों का कोई इन्द्राज अथवा रिकार्ड नहीं पाया गया।

डॉ. जितेन्द्र कटियार
वरिष्ठ पशु चिकी. अधिकारी
राजकीय प्रथम श्रेणी पशु चिकी
प्रतापपुरा (भीलवाड़ा)

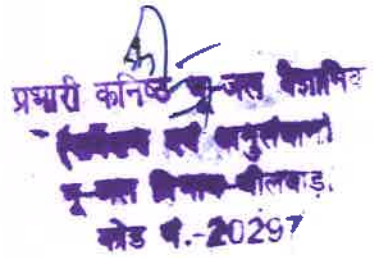
Dr. Mukesh mali
V.O
16/7/21
पशु चिकित्सा अधिकारी
प्रभारी-राजकीय पशु चिकित्सालय
रूपाहेली कलां (भीलवाड़ा)

16/07/21
(डॉ. सतीश मालवी)
वरिष्ठ पशु चिकित्सा अधिकारी
प्रभारी प्रथम श्रेणी पशु चिकित्सालय

Annexure-1

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MININING AREA FROM PREMONSOON 2011 TO POSTMONSOON 2020 PERIOD

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_11	WL_post_11	Flu_pre_post 2011	WL_pre_12	WL_post_12	Flu_pre_post 2012
Bhilwara	Hurda	Agoocha	DW	Kishor / Jagnnath Upadhya	Way To Bhalrukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	Dry	Dry	-	Dry	Dry	-
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	9.15	1.00	8.15	3.95	1.10	2.85
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA Iiphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-	-	-
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	9.95	8.10	1.85	10.85	8.30	2.55
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	covered	covered	-	12.25	4.35	7.90



Annexure-1

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MININING AREA FROM PREMONSOO

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_13	WL_post_13	Flu_pre_post 2013	WL_pre_14	WL_post_14	Flu_pre_post 2014	WL_pre_15	WL_post_15	Flu_pre_post 2015
Bhilwara	Hurda	Agoocha	DW	Keshar / Jagnnath Upadhya	Way To Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	Dry	Dry	-	11.80	11.70	0.10	11.70	13.50	-1.80
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	5.95	2.47	3.48	5.90	1.45	4.45	5.75	3.60	2.15
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA IIphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-	-	-	-	-	-
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	10.20	7.80	2.40	15.60	7.60	8.00	10.00	8.75	1.25
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	13.55	6.20	7.35	15.15	5.35	9.80	14.15	13.55	0.60

प्रभारी कनिष्ठ भूजल वैज्ञानिक
(निरीक्षण एवं अनुसंधान)
भू-जल विभाग, भीलवाड़ा
कोड नं.-20297

Annexure – 1

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MININING AREA FROM PREMONSOO

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_16	WL_post_16	Flu pre_post_16	WL_pre_17	WL_post_17	Flu pre_post_17	WL_pre_18	WL_post_18	Flu pre_post_18
Bhilwara	Hurda	Agoocha	DW	Keshar / Jagnnath Upadhya	Way To Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	14.60	9.00	5.60	11	12.60	-1.60	15.00	13.00	2.00
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	14.35	2.15	12.20	5.65	8.65	-3.00	13.65	4.35	9.30
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MUSA IIphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-	-	-	-	2.30	
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	10.40	7.60	2.80	9.2	7.20	2.00	8.90	4.20	4.70
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	Dry	3.15	-	11.5	12.45	-0.95	12.25	10.80	1.45

प्रभारी कनिष्ठ भू-जल वैज्ञानि
(सर्वेक्षण एवं अनुसंधान)
भू-जल विभाग-भीलवाड़ा
कोड नं.-20297

Annexure-1

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINIINING AREA FROM PREMONSOO

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_19	WL_post_19	Flu pre_post_19	WL_pre_20	WL_post_20	Flu pre_post_20	Fluct. pre 2011_pre 2020_	Remarks
Bhilwara	Hurda	Agoocha	DW	Kesar / Jagnath Upadhya	Way To Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	12.80	1.80	11.00	9.60	6.30	3.30	-	
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	filled	0.35	-	2.85	2.95	-0.10	6.30	
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA IIphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	4.90	0.80	4.10	1.30	3.20	-1.90	-	
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	10.00	4.90	5.10	6.50	6.70	-0.20	3.45	
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	12.80	2.40	10.40	3.05	1.85	1.20	-	

प्रभारी कनिष्ठ भूजल वैज्ञानि...
(सर्वेक्षण एवं अनुसंधान)
भू-जल विभाग-भीलवाड़ा
कोड नं.-20297

कार्यालय ब्लॉक मुख्य चिकित्सा अधिकारी गुलाबपुरा जिला भीलवाडा

कमांक –सामान्य/2021/ 423 दिनांक 26.8.21

श्रीमान उपखण्ड अधिकारी
गुलाबपुरा

विषय – हिन्दुस्तान जिंक लि. मे रामपुरा आगूँचा खान के आस पास खनन से समबन्धित बीमारी के रोगियो की सूचना हेतु।

संदर्भ – श्रीमान वरिष्ठ सहायक नियत्रंक माइसं आई बी एम माइंस मत्रांलय भारत सरकार के पत्र कमांक O.A. No 226 Of 2020 NGT द्वारा गठित कमेटी की बैठक दिनांक 13.07.2021 के कम में।

महोदयजी,

उपरोक्त विषयान्तर्गत एवं संदर्भित पत्र के कम में लेख है कि हिन्दुस्तान जिंक लिमिटेड़ रामपुरा आगूँचा खान के आस पास गुलाबपुरा ब्लॉक के सैक्टर गुलाबपुरा, हुरडा, आगूँचा,रूपाहेलीकलां, कवंलियास एवं सरेरी सैक्टर में विगत पॉच वर्षो से खनन सम्बन्धित बीमारियो जैसे अस्थमा,वायु प्रदूषण, जल प्रदूषण, लेड प्रदूषण से ग्रसित उतने मरीज ईलाज हेतु नही आये , जिससे कि लोक स्वास्थ्य समस्या माना जा सके। चिकित्सा विभाग के रिकार्ड में जितनी रोगियों की संख्या दर्शायी गई है उतने रोगी नही होकर रोगियो की चिकित्सलय मे विजिट है। किसी भी क्षेत्र में किसी विशेष बीमारी से ग्रसित बीमारी से रोगियो की संख्या एक प्रतिशत से अधिक होने पर जन स्वास्थ्य समस्या माना जाता है। उपरोक्त कारणो से किसी की भी मृत्यु नही हुई है।

ब्लॉक मुख्य चिकित्सा अधिकारी
गुलाबपुरा भीलवाडा

BCMO GULABPURA (BHILWARA)
Year Wise & Disceas Wise Catrgory Wise Report Inst

SNO	Year		Hurda	Agucha	Ruphailekalan	Kanwliyas	Sareri	Gulabpura	Total
1	2017	कुल ओपीडी	39382	19074	11265	3726	24347	95331	**193125**
		मलेरिया	5	0	1	6	0	0	**12**
		बीपी	829	560	284	725	51	3374	**5823**
		शुगर	391	45	310	535	9	1990	**3280**
		हार्ट	0	0	205	0	3	894	**1102**
		केसर	0	0	14	0	0	0	**14**
		अस्थमा	2560	20	180	825	81	2761	**6427**
		चर्मरोग	3375	0	816	917	2350	4188	**11646**
		Other(Gya+ILI+Dent+ Fever+ Sliocoices+Other)	32222	18359	9455	718	21880	82124	**164758**
		कुल योग	**39382**	**18984**	**11265**	**3726**	**24374**	**95331**	**193062**
2	2018	कुल ओपीडी	47982	19131	15738	3689	33692	100357	**220589**
		मलेरिया	2	0	2	11	0	0	**15**
		बीपी	1037	420	306	595	48	2975	**5381**
		शुगर	769	99	350	361	13	3126	**4718**
		हार्ट	0	0	260	0	2	808	**1070**
		केसर	0	0	13	0	0	0	**13**
		अस्थमा	790	17	210	910	74	3195	**5196**
		चर्मरोग	5400	0	1243	998	2649	4053	**14343**
		Other(Gya+ILI+Dent+ Fever+ Sliocoices+Other)	39984	18522	13354	814	30906	86200	**189780**
		कुल योग	**47982**	**19058**	**15738**	**3689**	**33692**	**100357**	**220516**
3	2019	कुल ओपीडी	54686	16156	17624	4228	31686	112747	**237127**
		मलेरिया	0	0	0	16	0	0	**16**
		बीपी	1361	430	325	645	54	3480	**6295**
		शुगर	780	128	370	725	16	2528	**4547**
		हार्ट	0	0	280	0	4	691	**975**
		केसर	0	0	21	0	0	0	**21**
		अस्थमा	2900	23	201	887	88	3339	**7438**
		चर्मरोग	4875	0	1549	927	2900	1213	**11464**
		Other(Gya+ILI+Dent+ Fever+ Sliocoices+Other)	44770	15575	14878	1028	28624	101496	**206371**
		कुल योग	**54686**	**16156**	**17624**	**4228**	**31686**	**112747**	**237127**
4	2020	कुल ओपीडी	40822	16158	17685	4235	31686	104502	**215088**
		मलेरिया	2	0	0	16	0	0	**18**
		बीपी	1799	430	325	645	54	3165	**6418**
		शुगर	1048	128	370	725	16	1940	**4227**
		हार्ट	0	0	280	0	4	861	**1145**
		केसर	0	0	21	0	0	0	**21**
		अस्थमा	2571	21	185	887	88	2600	**6352**
		चर्मरोग	3580	0	1549	927	2900	4228	**13184**
		Other(Gya+ILI+Dent+ Fever+ Sliocoices+Other)	31822	15577	14955	1035	28624	91708	**183721**
		कुल योग	**40822**	**16156**	**17685**	**4235**	**31686**	**104502**	**215086**
1	Block 2017 to 209	कुल ओपीडी	182872	70519	62312	15878	121411	412937	**865929**
		मलेरिया	9	0	3	49	0	0	**61**
		बीपी	5026	1840	1240	2610	207	12994	**23917**
		शुगर	2988	400	1400	2346	54	9584	**16772**
		हार्ट	0	0	1025	0	13	3254	**4292**
		केसर	0	0	69	0	0	0	**69**
		अस्थमा	8821	81	776	3509	331	11895	**25413**
		चर्मरोग	17230	0	5157	3769	10799	13682	**50637**
		Other(Gya+ILI+Dent+ Fever+ Sliocoices+Other)	148798	68033	52642	3595	110034	361528	**744630**
		कुल योग	**182872**	**70354**	**62312**	**15878**	**121438**	**412937**	**865791**

Annexure-XXI

Photographs taken during the committee visit during 12th -13th July 2021 in NGT OA 226/2020 Om Puri Vs HZL & Ors

Meeting with M/s Hindustan Zinc Limited, Agucha official on 12.07.2021

The view of the open cast & Underground mine

View of the crushing, screening plant covered with sheds

Haul road used for transportation of mined ore and overburden

Tailing pond

Overburden and seepage & rain-off water storage ponds

Less dense plantation on overburden and plant lease area

Committee having discussion with resident of Araniya Chauhan and nearby villagers

Damaged wells and pits in agricultural land

Water sample drawn from open dugwell for testing the water quality

Meeting with district administration & concern departments on 13.7.2021

7.0 ENVIRONMENT MONITORING PROGRAMME

7.1 Post Project Monitoring Schedule

The mitigation measures suggested in Chapter-5.0 will be implemented so as to reduce the impact on environment due to the operation of enhanced mining and plant activities. In order to facilitate easy implementation, mitigation measures be phased as per the priority of implementation.

The monitoring of various environmental parameters is necessary which is a part and parcel of the environmental protection measures. Monitoring is as important as that of control of pollution since the efficacy of control measures can only be determined by monitoring. A comprehensive monitoring program keeping in line with the existing monitoring strategy is being conducted by HZL. The existing monitoring programme shall be upgraded to meet the requirements of expansion programme. Environmental attributes monitored in and around the mine lease area are given below:

- ***Air Pollution and Meteorological Aspects***

Presently, HZL is monitoring ambient air quality every week in villages Agucha, Bherukhera and Kothiyan besides three locations in the mine lease area. The parameters monitored are SPM, RPM, SO_2 and NOx.

All the existing stacks are monitored for particulate matter emission every week. The dustfall rate is measured in the mining area.

HZL has installed automatic weather station to record meteorological parameters like wind speed, wind direction, temperature, relative humidity etc. The parameters are recorded continuously at one-hour interval.

It is further recommended to monitor the ambient air quality monitoring twice a week as per the CPCB guidelines. Further, adequate monitoring equipment shall be procured to meet the requirements.

- ***Water and Wastewater Quality***

HZL has constructed monitoring wells around the tailing dam and over burden dump to assess the impact on the ground water quality. The samples from these wells are collected and analyzed for the heavy metal concentration like lead, zinc, iron and cadmium. Besides this, HZL also collects water samples every month from the dug wells and bore wells located in the near by villages to assess the impact of the mining activity. The same will be continued.

- **Noise Levels**

The noise levels are recorded every month in mining area and mill area. The vibration levels are also recorded during blasting. It is further recommended to monitor the ambient noise levels in near by villages especially Bherukhera, Agucha

and New Rampura villages. Further, it is recommended to monitor noise during the blasting time at least once in a week or as per the frequency suggested by DGMS.

- **Soil Characteristics**

The soil samples are collected from eight locations around the mine area and analyzed for lead, zinc, cadmium, iron and pH. The sampling is done once each in pre-monsoon and winter season. This shall be continued during the expansion project also.

- **Ecology**

It is recommended to monitor metal content in vegetation in the surrounding villages. The metals shall cover Lead, Zinc and Cadmium. The monitoring shall be done at least twice in a year (Post monsoon and Summer).

The recommended Post Project Monitoring includes the consent conditions specified by RSPCB is outlined in **Table-7.1.**

TABLE-7.1
MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Sr. No.	Particulars		Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
1	**Air Pollution and Meteorology**				
	Air Quality				
	A	**Ambient Air Quality Monitoring**			
		1: Mine Pit 2: Magazine 3: Plant Main Gate; 4: Near by villages (Agucha, Kothiyan and Bherukhera)	Once in a week	24 hours continuously	Suspended particulate matter, RSPM, SO_2 , NO_x , CO, Pb, Zn, Fe and Cd
	B	**Dust fall**			
		1: Mine area (Mine pit, Laboratory, Magazine and Main Gate)	Every month except monsoon season	One month	Total Dustfall concentration and heavy metals like Pb, Zn, Fe and Cd.
	C	**Meteorology**			
	A	Meteorological data to be monitored at the site.	Daily	Continuous with automatic weather station	Wind speed and direction, temperature, rainfall, relative humidity
	D	**Stack Monitoring**			
		Primary Crusher; Secondary Crusher,DG sets and FOB stack	Once in a week	Iso-Kinetic	SPM, Heavy metals (Pb, Zn, Fe, Cd) and SPM, SO2 and NOX in DG sets
2	**Water and Wastewater Quality**				
	A]	**Industrial/Domestic**			
	1	Mine pit water	Once in a month	Grab sampling	As per EPA guide lines, 1986
	2	Beneficiation Plant,	Once in a	Grab	As per EPA guidelines,

Sr. No.	Particulars		Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
		tailing dam water, reclaim water and seepage water)	month		1986
	3	Drain & Sump Water (HVSC, Tailing dam)	monthly	grab	Oil & Grease
	4	Plant drinking water	weekly	grab	As per IS:10500
	5	Run-off water in rainy season (drains and waste dumps)	3 consecutive rainfalls	grab	Pb, Zn, Fe and Cd
	6	Colony Sewage	Monthly	grab	BOD, Total Solids, TDS and SS
	B]	**Water Quality in the Study Area**			
	i)	Surface water: 1) Agucha tank 2) Paperikhera pond 3) Kothiyan Devnadi	Once in a month	Grab	As per the parameters specified under IS:2296 (Class-C)
	ii)	Ground water: 1) 10 monitoring wells surrounding the tailing dam and mine 2) 17 Dug wells surrounding the mine lease area	Once in a month Once in a month	Grab Grab	As per the parameters specified under IS:10500
3	**Industrial Noise Levels**				
	1	Near the blasting/drilling site	Monthly	-	Noise levels in dB(A)
	2	Near crushing plant	Monthly	8 hr continuous with one hr interval	Noise levels in dB(A)
	3	Along the Haul road for transportation noise	Monthly	8 hr continuous with one hr interval	Noise levels in dB(A)
4	**Ambient Noise Levels**				
		1. Agucha village 2. Near by villages	Seasonally	8 hr continuous with one hr interval	Noise levels in dB(A)
5	**Soil Characteristics**				
	1	Near waste dump	Pre monsoon and Post monsoon	One grab sample	pH, Salinity, Heavy metals and NKP
	2	Near gossan dump			
	3	Near Paperikhera			
	4	Near Agucha village			
	5	Bherukhera village			
6	**Ecology**				
	1	Two Villages	Post Monsoon, Summer	Leaf and stem samples	Pb, Zn and Cd
7	**Occupational Health**				
		Blood Lead Analysis	Once in Five years	-	All the employees

7.2 Infrastructure for Environmental Protection

The mine has a full fledged environmental cell to supervise and implement the environmental related issues. This is supported by a fully equipped laboratory to carry out the analysis. The environmental cell has the following manpower on regular basis. The Unit head supervises the monitoring activities. Assistant General Manager (AGM) is in-charge to co-ordinate the monitoring activities. The environmental Management cell is shown in **Figure-7.1.**

Associate General Manager (Environment)

Qualified Chemical Engineer with 20 years of experience in Environmental monitoring and pollution control is responsible for implementing and monitoring the environmental attributes. He also acts as a liaison officer between the HZL and regulatory agencies like RSPCB, MoEF etc.

Engineer (Environment)

Qualified engineer will be responsible for all the environmental aspects.

Chemist

Post Graduate in Chemistry and a qualified chemist to carry out the analysis of various samples. Besides, adequate supporting staff is also available.

The above infrastructure set-up will be adequate for the proposed capacity expansion also.

7.3 Post Project Monitoring Equipment

7.3.1 Monitoring Equipment and Consumable

a) Air Quality and Meteorology

Following equipment and consumable items are available with the environmental cell to implement the monitoring program.

- Respirable Dust Sampler (4 no.)
- Stack Monitoring kit (2 no.)
- CO Monitor (1 no.)
- Weather station (automatic recording) (1 Set)
- Spectrophotometer (visible range) (1 no.)
- Single pan balance (1 no.)
- Relevant chemicals as per IS:5182 (Lumpsum)
- Personal sampler (1 no.)

In addition to the above, the following equipment shall be procured to meet the frequency requirement of capacity expansion project. These include:

- Respirable Dust samplers : 1 nos.
- Chemical/Glass ware : Lumpsum

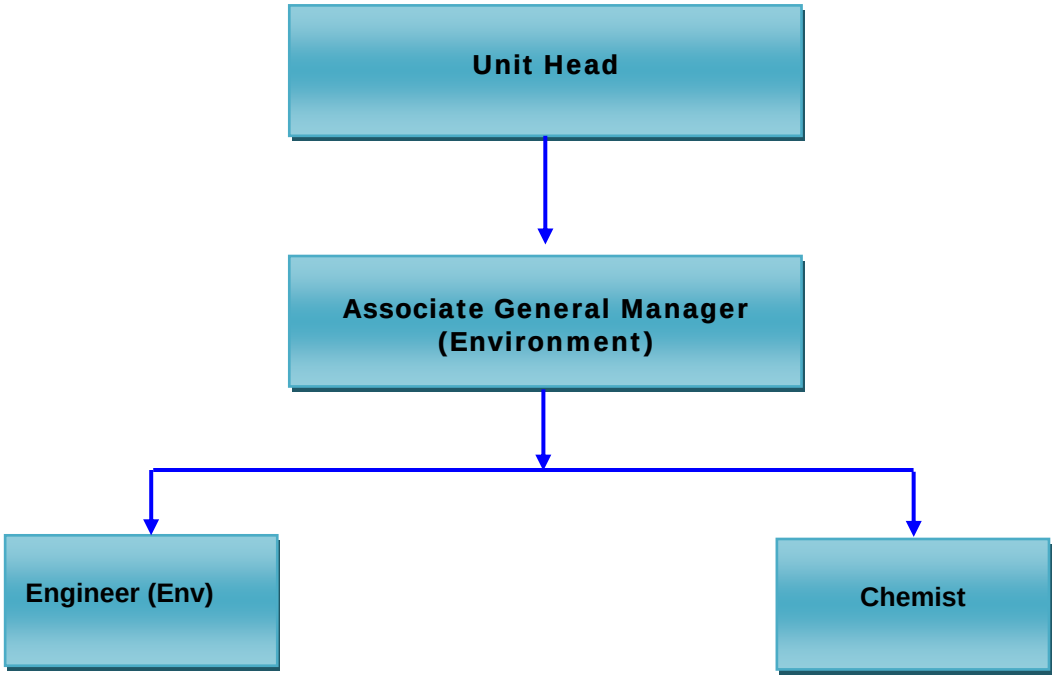


FIGURE-7.1
ENVIRONMENTAL MANAGEMENT CELL

b) Water and Wastewater Quality

The sampling should be done in jerry cans as per the standard procedures laid down by IS: 2488. Following equipment are available with the environmental cell:

- BOD incubator;
- Refrigerator;
- Oven;
- Stop watch;
- Thermometer;
- pH meter;
- Distilled water plant;
- Atomic Absorption Spectrophotometer;
- X- ray Fluorescence; and
- Relevant chemicals and glassware.

c) Noise Levels

The environment cell has sound level meter to record noise levels in different scales like A, B and C with slow and fast response options and vibration meter.

d) Soil Characteristics

The environment cell has soil samplers (auger) to collect soil samples. The samples are being analyzed in house (Plant Laboratory).

7.3 Budgetary Allocation for Pollution Control

The capital cost of the proposed expansion project will be Rs. 882 Crores. The budgetary allocation for the pollution control and monitoring equipment is given below in **Table-7.2.**

TABLE-7.2
BUDGETARY ALLOCATION FOR POLLUTION CONTROL

Sr. No.	Particulars	Capital Cost (Rs. in Lakhs)		Annual Recurring Cost (Rs. in Lakhs)	
		Existing	Proposed	Existing	Proposed
1	Pollution Control				
	a. Desliming Hydrocyclones	85	100	50	60
	b. Dust collection system for Crushers	10	50	3	05
	c. Sewage Treatment Plants	90	-	6	06
	d. High rate thickeners	150	100	20	20
	e. Water sprinkling on haul roads	40	300	10	20
	f. Truck tyre washing system	10	-	01	1.5
	g. Dumper cleaning system with oil trap	2	50	01	1.5
	h. Reclaim water storage tank	15	100	-	-
	i. Vacuum road sweeper	20	-	1	2
2	Pollution Monitoring equipments	20	10	2	3
3	Occupational Health	Existing facilities are adequate, capital cost of hospital is Rs. 41.73 lacs	Existing facilities are adequate	19.5	25
4	Green Belt Mine Township Road side	807	654*	10.0	10.0
5	Reclamation / Rehabilitation of mined out area				10
6	Dust Suppression Chemical on Haul Roads				100
Total Expenditure		**1290.73**	**1364**	**123.5**	**264**

****This expenditure on plantation will be incurred over a period of 10 –15 years***

The capital cost of proposed plantation schedule on the overburden is given in **Table-7.3.**

TABLE-7.3
PROPOSED PLANTATION SCHEDULE ON OVERBURDEN DUMP

Year	Area (ha)	No. of Trees	Total Cost (Rs)
2010-2011	4.8	4800	1440000
2011-2012	4.7	4700	1410000
2012-2013	7.9	7900	2370000
2013-2014	8.1	8100	2430000
2014-2015	7.3	7300	2190000
2015-2016	4.7	4700	1410000
2016-2017	4.2	4200	1260000
2017-2018	3.7	3700	1110000
2018-2019	3.1	3100	930000
2019-2020	10.0	15000	4500000
2020-2021	10.0	15000	4500000
2021-2022	20.0	30000	9000000
2022-2023	20.0	30000	9000000
2023-2024	20.0	30000	9000000
2024-2025	20.0	30000	9000000
2025-2026	13.0	19500	5850000
Total	**161.50**	**218000**	**65400000**

Item No. 04 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 226/2020
(Earlier O.A.68/2020(CZ))
(I.A. No. 94/2020 & I.A. No. 95/2020)

Om Puri Applicant

Versus

Hindustan Zinc Ltd. & Ors. Respondent(s)

Date of hearing: 05.02.2021

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

Applicant: Mr. Dharamveer Sharma, Advocate

Respondent(s): Mr. Krishnan Venugopal, Senior Advocate with Mr. U.N. Tiwary, Advocate for Hindustan Zinc Ltd.
Ms. Sapna Aggarwal, Advocate for MoEF&CC
Mr. Rohit Sharma, Advocate for RSPCB
Mr. OM Shankar Shrivastava for Indian Bureau of Mines

ORDER

1. This application has been filed with a grievance of violation of environmental norms by Hindustan Zinc Ltd., Udaipur, Rajasthan in executing a mining lease of Lead, Zinc and associated minerals at villages Agucha, Rampura, etc., Tehsil Hurd, District Bhilwada, Rajasthan covering nearly an area about 1200 hectares of mining land. In course of such mining residents of the said villages are adversely affecting on account of degradation of environment. There is heavy blasting and underground mining operations resulting in contamination of source of drinking of water, resulting in various diseases like Asthma and skin borne diseases. Live stocks are also affected. Dust and stone get accumulated close to the agricultural land and houses of the inhabitants. Toxic and contaminated waste water is discharged from the

mines. The area is 'over exploited' in terms of the ground water, notified as such by the CGWB. There are mammoth holes at many places because of unplanned underground mining. The applicant has relied upon photographs filed with the application. The applicants have assessed the damage in terms of money at Rs. 3.70 Lakhs. Atleast 15 other similar applications have been filed by the affected villagers being O.A. Nos. 49 to 53 of 2020 (CZ), 54 to 62 of 2020 (CZ) and 69 of 2020 (CZ).

2. The application was first taken up for hearing on 18.08.2020. The Tribunal issued notice and also sought an independent report from a joint Committee comprising Collector, Bhilwada and the State PCB, the State PCB being the nodal agency.

3. The respondent No. 1 mining Company has filed I.A. Nos. 94/2020 and 95/2020 to seek recall of order dated 18.8.2020 with regard to seeking an independent report from a joint Committee on the ground that this Tribunal has no jurisdiction to seek such a report without hearing the said Company. The said applications were heard on 16.09.2020 and directed to be considered further after the response to the application was filed by the opposite party.

4. Accordingly, we have taken up the matter for further consideration.

5. We have heard Shri Krishnan Venugopal, learned Senior Advocate for respondent No.1 in support of the above I.A.s He submitted that several such applications were earlier filed and disposed of by this Tribunal vide order dated 12.05.2016 in *O.A. Nos. 128/2014 & 129/2014, Raghu Nath v. Hindustan Zinc Ltd. & Ors*. On consideration of compliance report filed on 16.11.2014 about the remedial measures to

reduce the fugitive dust emissions, maintaining quality of drinking water and to improving environment, the Tribunal directed the Company to contain the dust and improve the air quality. The State PCB was required to quarterly monitor the ambient air quality and also to maintain the quality of water being supplied. The respondent No. 1 has denied that any damage was being caused to the environment and has mentioned the CSR activities for mitigation measures.

6. We find the IAs to be without any merit and lacking in bonafides. If five years back some grievance was considered does not mean that such grievance can never be considered later, particularly when environmentally hazardous activities are carried out. We fail to see how mere self-serving denial of an alleged violator can be a ground not to go into the matter. It is difficult to understand how seeking an independent report by this Tribunal should be objected to if the company is complying with the norms. Such applications are thus clearly devoid of bonafides, apart from being without any legal basis. The inherent power of this Tribunal to appoint such a Committee and obtaining an independent report under Rule 24 of the National Green Tribunal (Practices and Procedure) Rules, 2011 is no longer *res integra* in view of categorical judgment of the Hon'ble Supreme Court on the subject being *State of Meghalaya v. All Dimasa Students Union, Dima-Hasao District Committee v. Ors.*[1].

7. A factual report in the matter about compliance of norms by respondent No.1 be furnished as earlier directed vide order dated 18.08.2020 with the modification that the joint Committee will comprise of seven members i.e. the Collector Bhilwada, Rajasthan State PCB,

[1] (2019) 8 SCC 177, Paras 156 to 166