

**SPEED POST**

Ref : HZL/Kayad/ENV/MOEF/2020-21/

May 12, 2020

To,

**The Director,  
Regional Office, (Central Region)  
Ministry of Environment, Forest and Climate Change  
Kendriya Bhawan, 5th floor,  
Sector- H, Ali ganj  
LUCKNOW (UP)-226024**

**Sub: Six monthly environmental compliance report from October 2019 to March 2020.**

**Ref: Env clearance vide No. : J-110115/47/2012-IA.II (M) dated 5th Feb, 2018.**

Dear Sir / Madam,

Please find enclosed herewith the compliance status report of above referred Environmental Clearance granted by the Ministry of Environment, Forest and Climate Change for the period of October 2019 to March 2020 is for your kind perusal. Soft copy of compliance is also mailed and uploaded in the website.

Hope you find this in order.

Thanking you,

Yours faithfully



**(K.C. Meena)  
Director- SBU Kayad Mine**

Cc to:

1. In-Charge ( Zonal office)  
Central Pollution Control Board  
Zonal Office (Central)  
3rd Floor, Sahkar Bhawan,  
North T.T. Nagar,  
Bhopal – 462 003 (MP)
2. Member Secretary  
Rajasthan Pollution Control Board  
4 Institutional Area, Jhalana doogri  
Jaipur (Raj)

**Hindustan Zinc Limited**  
**Kayad Mine, Ajmer**

**Environment Clearance Compliance Report: -**

Name of the project: Kayad Lead- Zinc Underground Mine, M/S Hindustan Zinc Limited, Village kayad,  
Distt. Ajmer, Rajasthan.

Environmental Clearance letter no: J-11015/47/2012-IA.II (M) dated 5<sup>th</sup> Feb, 2018.

Period of Compliance report: October 2019 – March 2020

S.no	A. Specific Conditions	Compliance Status
1.	Environmental Clearance is Granted Subject to Under Hon'ble Supreme Court Judgment Date 02.08.2017	Noted
2.	Environmental Clearance is Granted Subject to Final Outcome of Hon'ble Supreme Court of India, Hon'ble High Court of Rajasthan and other Court of Law, if any, as May be Applicable to this project .	Noted
3.	This Environmental Clearance is subject to obtaining Requisite NBWL Clearance from the Standing Committee of National Board for Wildlife, if any, Applicable for this Mining Project	Not Applicable
4.	No Mining Activities Will be Allowed in Forest area, if any, for which the Forest Clearance is not Available.	No forest involved in mine lease area
5.	This Project Shall obtain Consent to Operate from the State Pollution Control Board, Rajasthan and effectively implement all the Conditions Stipulated therein.	Consent to Operate was granted by Rajasthan State Pollution Control Board Vide Ir no. F(Mines)/Ajmer(Ajmer)/303(1)/2017-2018 / 9550 - 9554 dated 17.02.2018 All the conditions are being implemented effectively.
6.	The Proponent should install online Ambient Air Quality Monitoring System and there should be system for display of digital AAQ data within 03 months at least at three locations as per wind direction. Online provisions of pH and Turbidity meters at discharge points of STP and ETP and also at water storage ponds in the mining area may be made; Project Proponent should display the result digitally in front of the main Gate of the mine site.	Online Ambient Air Quality Monitoring system installed and AAQ data digital displayed outside gate. pH and Turbidity meters at STP discharge point is also installed and result digitally displayed at outside gate of mine site.
7.	The Project Proponent has to take care of gullies formed on slopes. Dump mass should be consolidated with proper filling/leveling with the help of dozer/compactors. The report on slope and stability	Waste generated from Mining operations is being reused for back filling. No waste is accumulated at site.

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	monitoring should be sent to MoEF & CC and its Regional office every six-month.	
8.	The reclamation at waste dump sites shall be ecologically sustainable. Scientific reclamation has been followed. The local species may be encouraged and species are so chosen that the slope, bottom of the dumps and top of the dumps are able to sustain these species. The aspect of the dump is also a factor which regulates some climatic parameters and allows only species adapted to that micro climate. This may be recommended to be studied by hiring Expert Ecology Group.	As per IBM Approved Mining plan for the period 2017-18 to 2020 -21 vide Ir no. 584(4)(3)(1706) –ROM- Ajm /2213 dated 06.11.2017, All generated waste will be reused for back filling. No waste will be stored at Surface at the end of the mine life.
9.	There is need for regular monitoring of invertebrates and aquatic life of water bodies including the reservoir located close to the mining lease to establish that fish and other animals including the water is not 'contaminated' with heavy metal. There could be a research on "bio accumulation of heavy metals in invertebrates" to completely establish that there is no impact of mining.	Noted. The work order is given to NEERI, Nagpur for regular monitoring of invertebrates and aquatic life of water bodies including the reservoir located close to the mining lease. One field visit done and samples collected. PO enclosed as <b>Annexure I</b>
10.	A specialized Institution may be hired to carry out ecological survey on the plant species to evaluate their growth in terms of stunted, deformed and seed viability. The sensitive species and indicator species to heavy metal pollution may be screened out and plantation accordingly designed. Similarly, uptake of Zinc, Cadmium and lead etc. by crops and vegetables grown in the crop lands around the mining lease may be studied. Bottom sediment analysis of ponds, wells and Rivers to ascertain the level of accumulation of heavy metal may be done.	A specialized institution M/s National Environmental Engineering Research Institute (NEERI), Nagpur hired to carry out ecological survey. One field visit done and samples collected. Po enclosed as <b>Annexure-I</b>
11.	The Proponent shall conduct an Occupational health study with respect to the pressure impact on ear drums as person goes underground and implement the recommendations.	Ear to fit study conducted by M/s Sure Safety. No impacts on ear drums as person goes underground while wear the earplugs.
12.	Project Proponent shall carry out vibration studies well before approaching any such habitats or other buildings to evaluate the zone of influence and impact of blasting on the neighborhood. Within 500 meters of such sites vulnerable to blasting vibrations, avoidance of use of explosives and adoption of alternative means of mineral extraction. A provision for monitoring of each blast	Blasting being carried out during day time only and the vibration study is being done regularly by M/s CIMFR, Dhanbad. Peak Particle Velocity within 500 meters is ranging between 1.0 - 5.0 mm/second (Limit is

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	should be made so that the impact of blasting on nearby habitation and dwelling units could be ascertained. The covenant of lease deed under Rule 31 of MCR 1960 provides that no mining operations shall be carried out within 50 meters of public works such as public roads and buildings or inhabited sites except with the prior permission from the Competent Authority.	15mm/second) and due care is taken in blast design, explosives use, selection of detonators and delay to ensure safe vibration limit and effective implementation of CIMFR Dhanbad recommendation. No secondary blasting being carried out at site.
13.	Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. The material transfer points should invariably be provided with Bag filters and or dry fogging system. Belt-conveyors should be fully covered to avoid air borne dust; Use of effective sprinkler system to suppress fugitive dust on haul roads and other transport roads shall be ensured,	Mine haul roads in the mine being watered through sprinklers. Effective sprinkling system is in place to suppress fugitive dust on haul road.
14.	The monitoring of PM2.5 in the vehicle emission shall be conducted to improve the mine environment and report submitted to the Regional Office of the MoEFCC.	The monitoring of PM2.5 in ambient air near vehicular movement is conducted but not able to monitor PM 2.5 in vehicular emission due unavailability of technology/ instruments.
15.	The Project Proponent reported that there are seven Schedule-1 species viz. Peafowl ( <i>Pavo cristatus</i> ), Osprey ( <i>Pandion haliaetus</i> ), Tawny eagle ( <i>Aquila rapax</i> ), Crested honey buzzard ( <i>Pernis ptilorhynchus</i> ), Shikra ( <i>Accipiter badius</i> ), Leopard ( <i>Panthera pardus</i> ), Indian pangolin ( <i>Manis crassicaudata</i> ) in the study area. The PP shall implement the Conservation Plan and enhance the budget for implementation of Conservation Plan for Schedule I Species and also increase the budget for plantation/green development. The Proponent shall implement the Wildlife Conservation Plan along with the funds so allocated with consultation of Chief Wild Life Warden of the State Govt. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office, Lucknow and the Chief Wild Life Warden of the State Govt.	Conservation plan has been developed for Schedule-1 namely Peafowl ( <i>Pavo cristatus</i> ) and has been approved by the additional Principal Chief Conservation of Forest and Chief wildlife warden Jaipur, Rajasthan and implemented the same.  Action plan along with its implementation status report being submitted to RO MOEF & CC & Chief wild line warden of State Government.
16.	Proponent shall carry out monitoring of lead in the blood samples of the employees and the villagers in the areas surrounding the mine in their schedule of health check-up. The nearby water bodies shall be monitored every six months and report submitted to Regional office of the MoEFCC to ascertain impact due to lead contamination.	The Health checkups of villagers are carried out as per schedule. Report enclosed as <b>Annexure-II</b> Water samples analysis of nearby water bodies carried out regularly. <b>Annexure-II A</b>
17.	Implementation of Action Plan on the issues raised during the Public Hearing shall be ensured. The Project Proponent shall	Being implemented

	complete all the tasks as per the Action Plan submitted with budgetary provisions during the Public Hearing.	
18.	Implementation of the outcome of study with regard to "optimization of blast design parameter for the safety and stability of surface structures and subsequent monitoring of vibration on the surface structures for their long term stability" which was carried out by Central Institute of Mining and Fuel Research should be ensured.	<p>The Implementation of CIMFR study report is being ensured.</p> <ul style="list-style-type: none"> <li>• Regular vibration studies conducted through CIMFR</li> <li>• Peak Particle Velocity within 500 m ranging between 1.0 to 5.00 mm/sec (limit 15mm/sec)</li> <li>• Due care is taken in blast design, explosives use, selection of detonators and delay to ensure safe vibration limit.</li> </ul>
19.	Continuous monitoring of radioactive elements, if any, shall be undertaken till entire mine is dewatered and report has to be submitted to MoEFCC Regional Office. Periodic monitoring of any adverse impact of Radon and its daughter products on any worker should be included in the Occupational Health Monitoring Programmed.	The monitoring of radioactive element done. The report enclosed as <b>Annexure-III</b>
	<b>B. Standard conditions</b>	
1.	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest and Climate Change 5 years in advance of final mine closure for approval.	Shall be submitted.
2.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment, Forest and Climate Change.	Assured to comply
3.	No change in the calendar plan including excavation, quantum of mineral and waste should be made.	Being ensured as per Mine Plan.
4.	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) for the project.	Renewal application submitted for permission. Inspection by CGWB carried out in March 2020.
5.	Mining shall be carried out as per the provisions outlined in mining plan approved by Indian Bureau of Mines (IBM) as well as by abiding to the guidelines of Directorate General Mines Safety (DGMS).	Ensuring the Mining as per the Mine Plan approved by IBM and as per the guideline of DGMS
6.	The lands which are not owned by Proponent, mining will be carried out only after obtaining the consents from all the concerned land owners as per the provisions of the Mineral Concession Rules, 1960 and MMDR Act, 1957.	Ensured to comply
7.	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use. Pattern and report submitted to Ministry of Environment, Forest and Climate Change its Regional Office.	Digital processing of the entire lease area using remote sensing technique carried out M/s SRSAC Jodhpur and Report already submitted.
8.	The critical parameters as per the Notification 2009 such as Pm <sub>10</sub> , PM 2.5 NOx and Sox etc. in the ambient air within	The critical parameters such as PM10, PM 2.5, NOx and Sox etc. in

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	the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [(TDS, DO, PH and Total Suspended Solids (TSS)). The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The circular No. 3-20012/1/2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.	the ambient air are being monitored within the impact zone, peak particle velocity at Kayad Village being monitored regularly. Zero discharge is being maintained. PM 10, PM 2.5, NOx monitoring data and peak particle velocity data are being uploaded on website of the company as well as display board on main gate of the company.
9.	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of Phyllo and PM2.5 such as haul road, loading and unloading point and transfer points. Fugitive dust emissions from all the sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed under National Ambient Air Quality Standards (NAAQS) or by the Central Pollution Control Board in this regard. Monitoring of Ambient Air Quality to be carried out based on the Notification 2009, as amended from time to time by the Central Pollution Control Board.	An effective safeguard measure has been taken and regular water spraying on the haul road, loading and unloading area are being carried out. Ambient Air Quality parameters maintained and monitored as per National Ambient Air Quality Standards (NAAQS) or by the Central Pollution Control Board. Monitoring data enclosed as <b>Annexure-IV</b>
10.	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations. The monitoring shall be carried out four times in a year pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board.	Regular monitoring of ground water level and quality being carried out in and around the mine lease by establishing a network of existing wells and piezometers and data being submitted regularly to authorities. Water level and quality data attached as <b>Annexure -V a and Vb</b>
11.	Regular monitoring of the flow rate of the springs and perennial allays flowing in and around the mine lease shall be carried out and records maintain. The natural water bodies and or streams which are flowing in an around the village, should not be disturbed, The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Proponent has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug wall located in village should be incorporated to ascertain the impact of mining over ground water table.	No springs and perennial allays flowing in and around the mine lease.

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12.	Regular monitoring of water quality upstream and downstream of water bodies shall be carried out and record of monitoring data should be maintained and submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.	Analysis report Enclosed <b>Annexure-V</b>
13.	Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The project proponent shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads.	Transportation of the lead & zinc ore is being done by road which is passing through Highways.
14.	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.	Ensured the biological clock of the villagers by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limit for day and night.
15.	Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. The material transfer points should invariably be provided with Bag filters and or dry fogging system. In case of Belt-conveyors facilities the system should be fully covered to avoid air borne dust; Use of effective sprinkler system to suppress fugitive dust on haul roads and other transport roads shall be ensured.	Regular water sprinkling is being done on the haul road.
16.	Sufficient number of Gullies to be provided for better management of water. Regular Monitoring of pH shall be included in the monitoring plan and report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly bases.	Regular pH of mine water is being monitored. Report enclosed annexure-VI
17.	There shall be planning, developing and implementing facility of rainwater harvesting measures on long term basis and implementation of conservation measures to augment ground water resources in the area in consultation with Central Ground Water Board.	Water harvesting is being done and water recharge structure made in consultation with CGWA.
18.	The Project Proponent has to take care of gullies formed on slopes. Dump mass should be consolidated with proper	All the waste used in backfilling purpose.

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	filling/leveling with the help of Dozer/compactors.	
19.	The reclamation at waste dump sites shall be ecologically sustainable. Scientific reclamation shall be followed. The local species may be encouraged and species are so chosen that the slope, bottom of the dumps and top of the dumps are able to sustain these species. The aspect of the dump is also a factor which regulates some climatic parameters and allows only species adapted to that micro climate.	All the mine waste reused for backfilling of void stop.
20.	The top soil, if any, shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only and it should not be kept active for a long period of time. The maximum height of the dumps shall not exceed 8m and width 20 m and overall slope of the dumps shall be maintained to 45°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface runoff. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The entire excavated area shall be backfilled and afforested. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.	The top soil stored at earmark location of 9000 CuM soil in 645 Sq M and developed a beautiful garden on it. All the waste utilized in the mine void refilling. No such OB Dump.
21.	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, mineral and OB dumps to prevent run off of water and flow of sediments directly into the river and other water bodies. The water so collected should be utilized for watering the mine area, roads, Green belt development etc. The drains shall be regularly desilted Particularly after monsoon and maintained properly. The drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the river and other Water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt Material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.	Catch Drain of 1.0 m x 1.0 m size have been constructed around mine working to collect runoff water and connected to a designed siltation pond to allow proper settling of silt material. Water so collected used for dust suppression in mine area haul roads, green belt development, recharge etc . The drain and settling pond are being regularly de-silted and maintained properly.
22.	Plantation shall be raised in a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around water body, along the roads etc. by planting the native species in consultation with the local DFO/Agriculture Department and as per CPCB Guidelines. The density of the	Plantation has been raised around boundary of acquired area along the road etc. and included the native species provided by local DFO. More than 33% Greenbelt has



	trees should be around 2500 plants per ha. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	been developed in the mine acquired area. Till date <b>36600</b> no's saplings planted within lease area and 58000 sapling planted outside lease area.
23.	Project Proponent shall follow the mitigation measures provided in Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area", if any, applicable to the project.	Being ensured
24.	The Project Proponent shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project Proponent should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded against felling and plantation of such trees should be promoted.	Ensured
25.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any, spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department, A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.	A nursery has been developed within mine area for rare plant's species and other medicinal plants. Same being included in yearly plantation program to improve their existence.
26.	As per the Company Act, the CSR cost should be 2 % of average net profit of last three years. Hence CSR expenses should be as per the Company Act/Rule for the Socio Economic Development of the neighborhood Habitats which could be planned and ,executed by the Project Proponent more systematically based on the 'Need based door to door survey' by established Social Institutes/Workers. The report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly bases.	The baseline need assessment Survey done .
27.	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as Mel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed After the completion of the project.	The facilities are provided like Canteen, Toilets, STP, and safe drinking water and a permanent Doctor for their health care and crèche etc .
28.	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	Regular monitoring of the noise in work environment is being carried out and workers engaged in operations of HEMM are being

		ensured with ear muffs.
29.	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Oil and grease trap has been installed at vehicle washing area and clean water reuse for vehicle washing. Mine water reused for drilling and dust suppression, CRF Plant. Zero discharge Maintained.
30.	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.	Job specific PPE are mandatory for all workers and regular training being given on safety and health aspect.
31.	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	A separate environmental management department is in place under control of Unit Head.
32.	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office.	The funds earmarked for environmental protection measures and kept in separate account. The expenditure from April 2019 to September 2019 has been incurred Rs 91.45 Lacs to implement the Environmental Management Plan.
33.	The project authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	No additional land is required for proposed expansion.
34.	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment, Forest and Climate Change, its Regional Office, Central Pollution Control Board and State Pollution Control Board.	Being Complied
35.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	The project will extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.
36.	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing them proposal.	Being Complied
37.	State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/Tehsildar's Office for 30 days.	Complied
38.	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter Informing that the project	Complied

	has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at <a href="http://www.environmentclearance.nic.in">www.environmentclearance.nic.in</a> and a copy of the same should be forwarded to the Regional Office.	
14.	The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.	Assured to comply
15.	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the Provisions of the Environment (Protection) Act, 1986.	Assured to Comply
16.	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/ High Court of Rajasthan and any other Court of Law relating to the subject matter.	Assured to Comply
17.	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Assured to Comply

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**HINDUSTAN ZINC LTD****HINDUSTAN ZINC**

REPLY AT :  
HEAD OFFICE  
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UDAIPUR - 313004

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**SERVICE ORDER****PO No.: MAIL / 5100023790****Date: 18.09.2018**

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GST Registration No. :

HZL is pleased to release this order subject to following terms & conditions:

**1. Scope of Work:****Scope of Work #**

To comply the condition of Environment Clearance, we have to conduct the study on following topics around Kayad Lead Zinc Mine.

1. Monitoring of invertebrates and aquatic life of water bodies including the reservoir located close to the mining lease to establish that fish and other animals including the water is not 'contaminated' with heavy metal. There could be a study on "bio accumulation of heavy metals in invertebrates"
2. Carry out ecological survey on the plant species to evaluate their growth in terms of stunted, deformed and seed viability. The sensitive species and indicator species to heavy metal pollution may be screened out and plantation accordingly designed. Similarly, uptake of Zinc, Cadmium and lead etc. by crops and vegetables grown in the crop lands around the mining lease may be studied. Bottom sediment analysis of ponds, wells and Rivers to ascertain the level of accumulation of heavy metal may be done.

The component wise scope of work is as follows:

**2.1 Monitoring of water bodies (surface and groundwater) in and around mine lease area for heavy metal and other physico-chemical parameters**

- i) Collection of water samples from surface water bodies including ponds, lakes, reservoirs, rivers etc. and ground water samples from dug wells and bore wells in and around the mine lease area.
- ii) Preservation and transportation of samples to CSIR-NEERI for analysis of various physico-chemical parameters and heavy metals. (Some of the parameters namely pH, Conductivity and TDS will be determined on-site)
- iii) The samples will be collected in two seasons namely pre and post monsoon.
- iv) The analysis of heavy metals will be carried out using latest Inductively Coupled Plasma Mass Spectrometer (ICPMS)

Regd office , Yashad Bhawan, Swaroop Sagar, Udaipur - 313001.

- v) Determination of correlation between various water quality parameters and heavy metals and with other components
  - 2.2 Analysis of sediments of ponds, wells and Rivers to ascertain the level of accumulation of heavy metal, if any
    - i) Collection of sediment samples from surface water bodies including ponds, lakes, reservoirs, rivers etc. in and around the mine lease area.
    - ii) Preservation and transportation of samples to CSIR-NEERI for analysis of heavy metals
    - iii) Preparation of samples for analysis of including Zn, Pb, Cd, Ni, Cr, As, Cu, etc. using microwave digestion and further analysis using ICPMS.
    - iv) Determination of correlation between various heavy metals in respective water body with heavy metal content in sediments
  - 2.3 Monitoring of invertebrates and aquatic life (fish) of water bodies including the reservoir located close to the mining lease to assess bio accumulation of heavy metals, if any
    - i) Inventory of basic biodiversity to understand vertebrate species present in and around mine lease area.
    - ii) Collection of samples of invertebrates (earthworms, insects etc.) and fish samples from nearby ponds/lakes and reservoir in and around the lease area.
    - iii) Preservation and transportation of invertebrate samples to CSIR-NEERI for analysis of heavy metals including Zn, Pb, Cd, Ni, Cr, As, Cu etc.
    - iv) Assessment of Impact of mining activity on bio-accumulation of heavy metals in invertebrates and fishes
  - 2.4 Assessment of Impact of mining activities on soil quality and agriculture crops in the surrounding area with respect to Zinc, Cadmium and lead etc.
    - i) Basic biodiversity inventory to understand plant species present in and around mine lease area.
    - ii) Collection and analysis of soil samples in and around lease area from nearby fields to assess the levels of heavy metals in soils
    - iii) Collection of samples of crops, plants, vegetables and fruits grown around mine lease area to understand the levels of heavy metals
    - iv) Assessment of Impact of mining activity on accumulation of heavy metals in plants and plant products
  - 2.5 Assessment of Impact of mining activities on growth of vegetation within the lease area and carrying out ecological survey with a perspective to variety of plant species to be grown within the lease area.
    - i) Survey of the local flora to assess the basic floral biodiversity of the area
    - ii) Conducting ecological survey on the plant species to evaluate their growth in terms of stunted, deformed and seed viability.
    - iii) Assessments on the impact of mining activity on essential nutrient status and soil fertility
    - iv) Assessment of heavy metal mobility in soil-crop plant system
    - v) Selection of different plant species for re-vegetation with effective reclamation potential
    - vi) Assessment of Impact of mining activity on the growth and yield of crop plants
- Inputs Required from HZL:

# Provide all data, drawings, documents, reports etc. related to project work including hydrogeological data/maps

# Provide access to NEERI personnel and the sampling and analytical material carried by them to project site for field studies

# Provide personnel for guiding NEERI personnel during field studies.

#### Reports Submission

- I. 5 Copies of Interim Report for review and comments
- II. 5 Copies of Draft Final report for review and comments
- III. 10 Copies of Final report

#### 2. Contract Period: From 18.09.2018 to 17.09.2020

Contract Period: This contract is valid for providing services up to 17.09.2020.

Kindly ensure to creat SCN Before submission of invoice.

Billing & delivery address should be as below :-

Hindustan Zinc Ltd  
(Captive Unit : Kayar Mine), Rampura Agucha Mine  
P.O. Agucha,  
District - Bhilwara ( Raj) -311029

3. Contract Price: 3,540,000.00

THIRTY FIVE LAKH FORTY THOUSAND Rupees

Total PO Value is Rs. # 30,000,00/- plus taxes extra as actual.

Below things will be in HZL Scope

# Provide to & fro transport form nearest airport/railway station to project site and also during field studies or as per actual expense.

# Provide to and fro air tickets and free lodging and boarding to NEERI personnel during the field studies or as per actual invoice.

4. Payment Terms: Payable immediately Due net, .

100% payment shall be made within 15 days after receipt & acceptance of correct invoice duly certified by EIC or his authorized representative.

Installment Amount (Rs.) Mode Schedule

1st Installment Rs. 15,00,000/- +

GST (@ 18 %)

Advance payment To be paid along with work order

2nd Installment Rs. 10,00,000/- +

GST (@ 18 %) On the submission of interim/progress report 6 months from the date of commencement of Study

3rd Installment Rs. 5,00,000/- +

GST (@ 18 %) On Submission of "Draft Final Report" 16 months from the date of commencement of Study

Total

30,00,000/- +

GST @18% or extra as actual.

5. Security Deposit:

The security deposit is not applicable.

6. Performance Gaurantee:

The Performance Gaurantee is not applicable.

7. Liquidated Damage:

The Liquidated Damage is Not Applicable.

8. Details Of Articles

Sr No	Service Code Detailed description of Service	SAC Code	Rate	Qty.	Unit Amount	Del.Date
00010			3,000,000.00	1	AU	17.09.2020
	Environmental Study from specialized Ins					
	Price		3000000.00		3000000.00	



## Annexure-II

### Monitoring of lead in the blood samples of the employees and villagers

Sr.No	Name	Gender	Age (Yrs)	Pulse	Weight( kg)	Blood Pressure	Lead in blood (µg/dl)
1	Kamla	F	58	102	60	120/90	4.20
2	Bhagwati	F	40	89	55	120/90	3.40
3	Riyaz	F	33	105	65	110/90	3.03
4	Khurshida	F	40	98	65	100/70	3.40
5	Santosh Ojha	F	50	100	53	110/90	2.80
6	Jitendra Singh	M	34	102	73	110/70	4.82
7	Rustam	M	28	68	60	100/70	3.06
8	Saddam Hussain	M	25	85	66	100/80	2.43
9	Sopal	M	40	62	49	130/100	2.75
10	Vijendra Singh Kachawa	M	31	95	95	150/100	3.20
11	Gul Mohammed	M	28	97	75	120/80	3.52
12	Sanjay	M	26	98	70	120/80	4.52
13	Sunil Kumar	M	33	98	75	120/80	4.60
14	Harun	M	28	115	64	110/90	3.74
15	Saddam	M	23	89	49	105/90	4.02
16	Manish	M	23	102	81	120/100	5.14
17	Gul Mohammed	F	33	105	65	110/90	3.92
18	Norti	F	60	113	61	130/1000	3.23
19	Sajana	F	40	105	55	110/90	5.08
20	Maina Devi	F	34	102	55	110/90	4.78
21	Panchi	F	45	87	76	120/100	3.92
22	Mohd. Hussain	M	30	103	75	110/90	4.40
23	Islamuddin	F	22	65	71	110/90	4.74
24	Jamna	F	43	96	48	130/100	4.18
25	Sohni	F	35	100	62	120/90	3.40
26	Pratapi Devi	F	47	100	62	120/90	3.10
27	Kanchan	F	35	98	58	100/80	4.10
28	Shanwar Singh	M	22	80	60	100/80	3.90
29	Surendra Singh	M	28	100	74	120/90	4.28
30	Nani Devi	F	65	88	40	140/100	3.62
31	Sushila	F	32	150	48	130/100	4.18
32	Ramswaroop	M	34	84	65	110/90	4.26
33	Bhanwar Lal	M	42	98	70	140/100	4.74
34	Vishnu	M	24	81	53	100/80	5.12
35	Nasaruddin	M	49	88	80	140/100	5.02
36	Chhitar	M	70	95	62	140/100	3.75
37	Jogendra	M	27	100	64	120/80	3.44
38	Surendra Kumar	M	33	90	78	110/70	5.12
39	Narendra Singh	M	53	105	85	140/90	4.42
40	Bheru singh	M	32	75	68	110/70	4.22

*mahl*



## TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)



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Ph.: 94602-22039, 94602-22049  
E-mail : teamtesthouse@gmail.com  
E-mail : director@teamtesthouse.com

### TEST REPORT

Report No./ULR No. :	TC502519100001840F	Date :	26-11-2019
Issued To :	M/S Hindusthan Zinc Limited (Kayad Mines) Village Kayad, District Ajmer (Rajasthan).	Type of Unit :	Underground Mines
Type of Sample :	Potable and Domestic Water	Date of Sample Collection/Monitoring :	09-11-2019
Point of Collection :	Sarwan Talab (Surface water)	Date of Receipt :	11-11-2019
Date of Test/Analysis :	11-11-2019 to 26-11-2019	Sampling Plan :	IS 3025:1987(Part 1)RA 2014
Quantity of Sample :	2 ltr.	Sample Collected By :	Rakesh Sharma
Unit's representative :	Mansingh Gehlot	Condition of Sample :	Fit for testing

### RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
1	Color [Hazen]	Less than 5	IS 3025 (Part 4) : 1983 RA 2017	5.00	15.00
2	Odour	Agreeable	IS 3025 (Part 5) : 1983 RA 2017	Agreeable	-
3	Taste	Agreeable	IS 3025 (Part 7 & 8) : 1984 RA 2017	Agreeable	-
4	Turbidity [NTU]	BDL(<0.1)	IS 3025 (Part 10) : 1984 RA 2017	1.00	5.00
5	pH	7.68	IS 3025 (Part 11) : 1984 RA 2017	6.50 - 8.50	-
6	Hardness (total) [mg/l]	104	IS 3025 (Part 21) : 1983 RA 2014	200.00	600.00
7	Iron [mg/l]	BDL(<0.01)	IS 3025 (Part 53) : 2003 RA 2014	0.3	-

Note:

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Website : www.teamtesthouse.com

## RESULTS

S.No.	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
8	Chloride [mg/l]	12.08	IS 3025 (Part 32) : 1988 RA 2014	250.00	1000.00
9	Total Dissolved Solids [mg/l]	148	IS 3025 (Part 16) : 1984 RA 2017	500.00	2000.00
10	Calcium [mg/l]	25.6	IS 3025 (Part 40) : 1991 RA 2014	75.00	200.00
11	Magnesium [mg/l]	9.72	IS 3025 (Part 46) : 1994 RA 2014	30.00	100.00
12	Copper [mg/l]	BDL(<0.01)	IS 3025 (Part 42) : 1992 RA 2014	0.05	1.50
13	Manganese [mg/l]	BDL(<0.01)	IS 3025 (Part 59) : 2006 RA 2017	0.1	0.3
14	Sulphate [mg/l]	11.5	IS 3025 (Part 24) : 1986 RA 2014	200.00	400.00
15	Nitrate [mg/l]	2.52	IS 3025 (Part 34) : 1988 RA 2014	45.00	-
16	Fluoride [mg/l]	0.14	IS 3025 (Part 60) : 2008 RA 2013	1.00	1.50
17	Cadmium [mg/l]	BDL(<0.001)	IS 3025 (Part 41) : 1992 RA 2014	0.003	-
18	Arsenic [mg/l]	BDL(<0.001)	IS 3025 (Part 37) : 1988 RA 2014	0.01	0.05
19	Lead [mg/l]	BDL(<0.01)	IS 3025 (Part 47) : 1994 RA 2014	0.01	-
20	Zinc [mg/l]	BDL(<0.01)	IS 3025 (Part 49) : 1994 RA 2014	5.00	15.00
21	Alkalinity - T [mg/l]	108	IS 3025 (Part 23) : 1986 RA 2014	200.00	600.00
22	Aluminum [mg/l]	BDL(<0.01)	IS 3025 (Part 55) : 2003 RA 2014	0.03	0.2
23	Boron [mg/l]	0.41	IS 13428 (Annexure H)	0.5	1.0
24	sulphide [mg/l]	Less than 0.05	IS 3025 (Part 29) : 1986 RA 2014	0.05	-
25	Total Chromium [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.05	-
26	Mercury [mg/l]	BDL(<0.001)	IS 3025 (Part 48) : 1994 RA 2014	0.001	-
27	Mineral oil [mg/l]	BDL(<0.5)	IS 3025 (Part 39) : 1991 RA 2014	0.5	-

Note:

Continue to next page...

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Ph: 94602-22039, 94602-22049  
E-mail : info@teamtesthouse.com  
E-mail : director@teamtesthouse.com

RESULTS					
S.No.	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
28	Cyanide [mg/l]	BDL(<0.01)	IS 3025 (Part 27) : 1986 RA 2014	0.05	-
29	Anionic Surface Detergents as MBA's [mg/l]	BDL(<0.1)	IS 13428 (Annexure K)	0.20	1.00
30	Nickel [mg/l]	BDL(<0.01)	IS 3025 (Part 54) : 2003 RA 2014	0.02	-
31	Phenolic Compound [mg/l]	BDL(<0.001)	IS 3025 (Part 43) : 1992 RA 2014	0.001	0.002
32	Free residual chlorine [mg/l]	BDL(<0.1)	IS 3025 (Part 26) : 1986 RA 2014	0.2	1.0
33	Barium as Ba++ [mg/l]	BDL(<0.5)	IS 13428 (Annexure F)	0.7	-
34	Ammonia as NH <sub>3</sub> [mg/l]	BDL(<0.1)	IS 3025 (Part 34) : 1988 RA 2014	0.5	-
35	Silver as Ag [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.1	-
36	Chloramines [mg/l]	BDL(<0.1)	APHA 2017 : 4500- Cl- B	0.1	-

**Notes :-**

- # Parameter No. 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36 covered under NABL scope and Parameter No. NONE does not cover under NABL scope
- # Parameter No. NONE outsourced for testing.
- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

*Puran*  
**Puran Mal Yogi**  
Senior Analyst

*Raj*  
**Rajesh Maheshwari**  
Authorized Signatory  
(Report No: TC502519100001840F)



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E-mail : teamtesthouse@gmail.com  
E-mail : director@teamtesthouse.com

## TEST REPORT

Report No./ULR No. :	TC502519100001841F	Date :	26-11-2019
Issued To :	M/S Hindusthan Zinc Limited (Kayad Mines) Village Kayad, District Ajmer (Rajasthan),	Type of Unit :	Underground Mines
Type of Sample :	Potable and Domestic Water	Date of Sample Collection/Monitoring :	09-11-2019
Point of Collection :	Phool Sagar (Surface water)	Date of Receipt :	11-11-2019
Date of Test/Analysis :	11-11-2019 to 26-11-2019	Sampling Plan :	IS 3025:1987(Part 1)RA 2014
Quantity of Sample :	2 ltr.	Sample Collected By :	Rakesh Sharma
Unit's representative :	Mansingh Gehlot	Condition of Sample :	Fit for testing

## RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
1	Color [Hazen]	Less than 5	IS 3025 (Part 4) : 1983 RA 2017	5.00	15.00
2	Odour	Agreeable	IS 3025 (Part 5) : 1983 RA 2017	Agreeable	-
3	Taste	Agreeable	IS 3025 (Part 7 & 8) : 1984 RA 2017	Agreeable	-
4	Turbidity [NTU]	BDL(<0.1)	IS 3025 (Part 10) : 1984 RA 2017	1.00	5.00
5	pH	7.85	IS 3025 (Part 11) : 1984 RA 2017	6.50 - 8.50	-
6	Hardness (total) [mg/l]	88	IS 3025 (Part 21) : 1983 RA 2014	200.00	600.00
7	Iron [mg/l]	BDL(<0.01)	IS 3025 (Part 53) : 2003 RA 2014	0.3	-

Note:

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PIN : 302022-22039, 94602-22049  
E-mail : teamtesthouse@gmail.com  
E-mail : teamtesthouse@teamtesthouse.com

## RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
8	Chloride [mg/l]	40.27	IS 3025 (Part 32) : 1988 RA 2014	250.00	1000.00
9	Total Dissolved Solids [mg/l]	231	IS 3025 (Part 16) : 1984 RA 2017	500.00	2000.00
10	Calcium [mg/l]	24	IS 3025 (Part 40) : 1991 RA 2014	75.00	200.00
11	Magnesium [mg/l]	6.8	IS 3025 (Part 46) : 1994 RA 2014	30.00	100.00
12	Copper [mg/l]	BDL(<0.01)	IS 3025 (Part 42) : 1992 RA 2014	0.05	1.50
13	Manganese [mg/l]	BDL(<0.01)	IS 3025 (Part 59) : 2006 RA 2017	0.1	0.3
14	Sulphate [mg/l]	32.67	IS 3025 (Part 24) : 1986 RA 2014	200.00	400.00
15	Nitrate [mg/l]	5.22	IS 3025 (Part 34) : 1988 RA 2014	45.00	-
16	Fluoride [mg/l]	0.17	IS 3025 (Part 60) : 2008 RA 2013	1.00	1.50
17	Cadmium [mg/l]	BDL(<0.001)	IS 3025 (Part 41) : 1992 RA 2014	0.003	-
18	Arsenic [mg/l]	BDL(<0.001)	IS 3025 (Part 37) : 1988 RA 2014	0.01	0.05
19	Lead [mg/l]	BDL(<0.01)	IS 3025 (Part 47) : 1994 RA 2014	0.01	-
20	Zinc [mg/l]	BDL(<0.01)	IS 3025 (Part 49) : 1994 RA 2014	5.00	15.00
21	Alkalinity - T [mg/l]	100	IS 3025 (Part 23) : 1986 RA 2014	200.00	600.00
22	Aluminum [mg/l]	BDL(<0.01)	IS 3025 (Part 55) : 2003 RA 2014	0.03	0.2
23	Boron [mg/l]	0.39	IS 13428 (Annexure H)	0.5	1.0
24	sulphide [mg/l]	Less than 0.05	IS 3025 (Part 29) : 1986 RA 2014	0.05	-
25	Total Chromium [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.05	-
26	Mercury [mg/l]	BDL(<0.001)	IS 3025 (Part 48) : 1994 RA 2014	0.001	-
27	Mineral oil [mg/l]	BDL(<0.5)	IS 3025 (Part 39) : 1991 RA 2014	0.5	-

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E-mail : [director@teamtesthouse.com](mailto:director@teamtesthouse.com)

## RESULTS

S. No.	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
28	Cyanide [mg/l]	BDL(<0.01)	IS 3025 (Part 27) : 1986 RA 2014	0.05	-
29	Anionic Surface Detergents as MBA's [mg/l]	BDL(<0.1)	IS 13428 (Annexure K)	0.20	1.00
30	Nickel [mg/l]	BDL(<0.01)	IS 3025 (Part 54) : 2003 RA 2014	0.02	-
31	Phenolic Compound [mg/l]	BDL(<0.001)	IS 3025 (Part 43) : 1992 RA 2014	0.001	0.002
32	Free residual chlorine [mg/l]	BDL(<0.1)	IS 3025 (Part 26) : 1986 RA 2014	0.2	1.0
33	Barium as Ba <sup>++</sup> [mg/l]	BDL(<0.5)	IS 13428 (Annexure F)	0.7	-
34	Ammonia as NH <sub>3</sub> [mg/l]	BDL(<0.1)	IS 3025 (Part 34) : 1988 RA 2014	0.5	-
35	Silver as Ag [mg/l]	BDL(<0.01)	APHA : 2017 : 3111- B	0.1	-
36	Chloramines [mg/l]	BDL(<0.1)	APHA : 2017 : 4500- Cl- B	0.1	-

### Notes :-

- # Parameter No. 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36 covered under NABL scope and Parameter No. NONE does not cover under NABL scope.
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- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

**Puran Mal Yogi**  
Senior Analyst

**Rajesh Maheshwar**  
Authorized Signatory  
(Report No: TC502519100001841F)

**INTERNATIONAL ENVIRONMENT CONSULTING**

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 E-Mail : vkpanday@iec-india.com  
 Website : www.iec-india.com  
 TIN : 07170190353 dated 01.04.2005

To  
 Sr. Manager(ENV)  
 Hindustan Zinc Limited  
 Kayad Mine  
 Ajmer . Rajasthan

11.04.2018

**Sub:Results of the survey report carried out in Kayad Zinc Mines,  
 Ajmer**

Date of survey: 11.04.2018

Instrument used: AlphaGard radon monitor DF 2000

**Table 1. Results of the measurement carried out in 3 locations inside the mine**

Location Details	Temp (°C)	Pressure (mBar)	RH (%)	Radon (Bq m <sup>-3</sup> )	Location Conditions
175 MRL Near Refuge Chamber	33.5	985.3	32.9	116 ± 50	Good air flow
200 MRL Near South Decline	32.0	983.0	32.0	158 ± 42	Moderate air flow
200 MRL S 200 x cut 4	31.0	982.0	43.1	51 ± 15	Working area

The radon levels observed at the three locations are within the limits of the Occupational exposure level stipulated by Atomic Energy Regulatory Board (AERB) for mining of Uranium. The level prescribed by AERB is 1000 Bq m<sup>-3</sup> (EER).

(K.P. Eappen)  
 Consultant, IEC, New Delhi

**HINDUSTAN ZINC LIMITED  
KAYAD MINE**

**AMBIENT AIR MONITORING**

**Annexure-IV**

Location->		Mine Area						Kayad					
month-year	Forthnight	SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
Oct-19	Ist	115.05	36.63	23.22	3.17	10.66	320	215.52	59.81	22.95	6.94	18.69	290
	IIInd	200.98	66.52	42.42	7.43	24.98	340	182.31	66.48	42.43	5.99	19.06	300
Nov-19	Ist	219.71	65.73	44.61	2.56	10.91	290	281.31	66.07	44.85	4.38	12.92	310
	IIInd	232.67	65.84	47.46	2.74	13.18	280	206.3	52.68	48.91	5.39	15.32	340
Dec-19	Ist	216.49	84.97	40.38	2.76	13.14	280	287.05	88.55	35.89	5.1	18.22	240
	IIInd	215.05	77.43	32.16	2.58	11.52	260	230.27	72.82	37.12	6.8	13.48	290
Jan-20	Ist	229.63	79.82	41.33	3.88	13.74	240	236.59	61.56	30.85	5.18	11.73	270
	IIInd	237.76	77.55	30.00	4.27	9.11	240	225.16	72.39	34.12	3.45	12.28	270
Feb-20	Ist	209.68	68.44	32.73	7.68	12.88	260	325.31	69.24	34.33	5.88	13.59	270
	IIInd	207.12	76.74	34.43	3.78	12.59	290	295.52	66.32	34.63	6.82	16.14	270
Mar-20	Ist	252.56	76.30	30.55	4.96	11.08	260	318.26	64.36	30.53	3.90	17.82	280
	IIInd	261.25	78.37	32.15	5.84	14.30	350.00	178.35	73.45	29.31	4.52	12.70	270.00

Location->		Lohagal						Gagwana					
month-year	Forthnight	SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
Oct-19	Ist	194.51	59.1	29.47	2.73	8.9	330	123.22	45.17	26.99	7.11	19.73	330
	IIInd	264.5	76.34	45.87	5.75	22.28	350	201.56	60.47	41.5	6.61	19.22	320
Nov-19	Ist	234.43	82.44	37.18	6.08	20.22	290	228.65	67.58	39.88	6.94	16.23	350
	IIInd	275.79	83.94	42.4	6.96	19.77	280	315.7	84.18	38.99	7.22	15.78	320
Dec-19	Ist	261.54	76.63	28.51	3.4	14.79	280	312.29	83.59	45.45	6.83	15.99	320
	IIInd	265.06	80.34	48.07	6.49	17.15	260	237.55	82.63	36.16	6.39	12.12	270
Jan-20	Ist	259.70	79.03	34.92	6.18	17.09	340	196.92	63.34	28.24	4.15	13.84	260
	IIInd	191.36	60.34	34.71	3.33	11.81	260	241.58	81.40	28.24	4.15	13.84	260
Feb-20	Ist	322.68	86.14	37.30	6.21	17.89	360	297.41	82.49	42.81	7.30	14.94	240
	IIInd	264.22	61.06	33.57	5.44	17.38	260	315.01	75.62	41.10	5.97	12.70	260
Mar-20	Ist	305.54	86.79	43.00	7.21	15.13	260	337.51	72.86	27.47	7.56	15.42	250
	IIInd	214.7	75.42	27.43	4.38	11.3	280	231.45	71.47	29.63	4.76	12.8	240

Location->		Chatri					
month-year	Forthnight	SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
Oct-19	Ist	220.31	56.71	25.22	5.91	17.85	360
	IIInd	117.54	48.35	34.06	5.47	16.11	360
Nov-19	Ist	232.85	54.86	35.62	6.04	17.8	280
	IIInd	287.41	81.32	42.83	5.61	15.88	250
Dec-19	Ist	327.84	77.9	44.48	5.18	14.12	280
	IIInd	233.78	64.72	34.61	5.13	10.02	290
Jan-20	Ist	189.70	57.82	24.79	3.34	17.00	260
	IIInd	238.72	85.24	28.75	6.02	15.51	280
Feb-20	Ist	336.79	78.58	32.34	4.87	12.31	270
	IIInd	242.42	82.93	43.05	6.03	16.04	280
Mar-20	Ist	237.97	66.62	33.91	6.83	18.81	250
	IIInd	196.37	67.81	24.75	4.31	10.76	210

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**Water level of Piezometers & open wells  
Surrounding Kayar mines, District Ajmer (Raj.)**

**Annexure V (a)**

S.No.	Source Code	Location with land mark	Latitude	Longitude	WL (BGL) (in mt) 29-11-2019	WL (BGL) (in mt) 29-02-2020
1	P-1	Piezometer-1, near VTC- HZL	N26°31'44.1"	E74°41'19.2"	13.50	16.50
2	P-2	Near mine dumped area, HZL fuel pump	N26°31'56.9"	E74°41'41.1"	12.50	12.80
3	P-3	Plantation area, nursery, near other collapsed bore well	N26°32'10.0"	E74°41'44.4"	13.55	14.80
4	P-4	New drilled bore well, near SMS plant, HZL boundary wall corner	26°32'02.0"	74°41'45.2"	3.70	4.80
5	P-5	New drilled bore well, DG Set area	26°31'40.3"	74°41'29.1"	11.20	11.30
6	W-1	Man Singh Raghuveer singh Chandawal, Kayar	N26°33'25.7"	E74°41'45.9"	12.80	13.20
7	W-2	Misri lal Bambi, Kayar, Odiya Tgada	N26°32'48.6"	E74°42'24.8"	16.70	17.00
8	W-3	Near Talab area, land planning by propoerty dealers/ poltary farm	N26°32'08.3"	E74°42'27.7"	18.20	19.00
9	W-4	Ganpati Nagar, Radhey Krishana appart/Sai International school	N26°31'11.7"	E74°41'02.7"	Filled	filled
10	W-5	Near outside HZL boundary wall, near outside HZL road area	N26°31'52.7"	E74°41'36.0"	Filled	filled
11	W-6	Near Govt. School/Mr. Sultan Master, Kamuridin Nizam ji Kayar	N26°31'38.7"	E74°41'11.3"	12.50	14.00

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# Piezometer water quality monitoring data

## Annexure-V (b)

Parameters	P1		P2		P3		P4		P5	
	Dec-19	Mar-20	Dec-19	Mar-20	Dec-19	Mar-20	Dec-19	Mar-20	Dec-19	Mar-20
pH	7.02	7.43	7.18	7.55	7.62	7.48	7.01	7.25	7.3	7.45
Hardness	810	800	650	650	200	240	430	460	400	410
Iron	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloride	506.82	508.48	900.15	913.42	582.16	561.35	426.59	434.25	551.83	566.51
Total Dissolved Solid	2536	2542	2942	2973	2291	2287	2161	2178	2737	2755
Copper	0.04	0.03	BDL	BDL	BDL	BDL	BDL	BDL	0.01	0.01
Sulphate	345.83	361	253.33	287.47	175	213	337.5	342	379.17	386
Cadmium	BDL	0.001	0.002	0.001	0.003	0.002	BDL	BDL	BDL	BDL
Lead	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	0.32	0.35	0.02	0.07	BDL	BDL	0.02	0.05	0.12	0.1
Alkalinity	470	470	380	390	550	530	40	390	520	550
Nickel	BDL	BDL	0.02	0.02	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cobalt	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Total suspended solid	8	13	14	10	12	8	8	11	22	13
Total solid	2550	2567	2956	2986	2304	2297	2170	2185	2757	2774

All figureas are in mg/l except pH

# Ground water Monitoring around mine lease area

## Annexure-V (c)

Parameters	Gagwana Village (Borewell Water) May 2019		Lohagal Village (Borewell Water) Feb 2019		Chatri Village (Handpump Water) Feb 2019		Kayad Village (Handpump water) Feb 2019	
	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	8.06	7.96	7.37	7.47	7.16	5.98	7.75	7.29
Hardness	270	128	1340	1420	1260	1280	132	216
Iron	BDL	BDL	BDL	BDL	BDL	0.06	BDL	0.05
Chloride	412.78	43.99	1057.2	1449.55	1741.73	1424.56	34.23	25.99
Total Dissolved Solid	1514	293	3751	4277	4441	4505	209	294
Copper	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sulphate	201.67	32.5	458.33	662.5	285	462.5	26	8
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	BDL	0.09	0.23	0.38	BDL	0.26	BDL	0.24
Alkalinity	380	124	460	480	540	400	120	224
Total suspended solid	7	3	5	2	17	8	10	13
Cobalt	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Total solid	1521	246	3756	4280	4458	4515	222	316

All figures are in mg/l except pH



**pH meter Reading of Mine Water****Annexure-VI**

Oct-19		Nov-19		Dec-19	
Date	pH	Date	pH	Date	pH
01-10-2019	7.4	01-11-2019	6.9	01-12-2019	7.1
02-10-2019	7.3	02-11-2019	6.9	02-12-2019	7.0
03-10-2019	7.3	03-11-2019	7.0	03-12-2019	7.1
04-10-2019	7.2	04-11-2019	7.0	04-12-2019	7.2
05-10-2019	7.2	05-11-2019	6.8	05-12-2019	7.2
06-10-2019	7.1	06-11-2019	6.9	06-12-2019	7.1
07-10-2019	7.1	07-11-2019	7.1	07-12-2019	7.0
08-10-2019	7.2	08-11-2019	7.0	08-12-2019	6.8
09-10-2019	7.2	09-11-2019	7.0	09-12-2019	6.9
10-10-2019	7.3	10-11-2019	7.1	10-12-2019	7.0
11-10-2019	7.2	11-11-2019	6.8	11-12-2019	7.0
12-10-2019	7.0	12-11-2019	6.9	12-12-2019	6.9
13-10-2019	6.9	13-11-2019	6.8	13-12-2019	6.8
14-10-2019	6.9	14-11-2019	6.9	14-12-2019	6.9
15-10-2019	7.0	15-11-2019	7.1	15-12-2019	6.9
16-10-2019	7.0	16-11-2019	7.3	16-12-2019	7.0
17-10-2019	6.9	17-11-2019	7.0	17-12-2019	7.1
18-10-2019	6.9	18-11-2019	6.8	18-12-2019	7.0
19-10-2019	6.9	19-11-2019	6.9	19-12-2019	7.1
20-10-2019	6.9	20-11-2019	6.8	20-12-2019	7.1
21-10-2019	7.0	21-11-2019	6.8	21-12-2019	7.0
22-10-2019	7.0	22-11-2019	7.0	22-12-2019	6.9
23-10-2019	7.0	23-11-2019	7.1	23-12-2019	6.9
24-10-2019	6.9	24-11-2019	7.2	24-12-2019	6.8
25-10-2019	6.8	25-11-2019	7.0	25-12-2019	7.0
26-10-2019	6.7	26-11-2019	7.0	26-12-2019	6.9
27-10-2019	6.8	27-11-2019	7.1	27-12-2019	7.0
28-10-2019	6.9	28-11-2019	7.0	28-12-2019	7.2
29-10-2019	7.0	29-11-2019	6.9	29-12-2019	7.0
30-10-2019	6.9	30-11-2019	6.8	30-12-2019	7.1
31-10-2019	7.0			31-12-2019	7.1

*mahid*

### pH meter Reading of Mine Water

Jan-20		Feb-20		Mar-20	
Date	pH	Date	pH	Date	pH
01-01-2020	7.0	01-02-2020	7.0	01-03-2020	7.4
02-01-2020	7.1	02-02-2020	7.1	02-03-2020	7.5
03-01-2020	7.0	03-02-2020	6.9	03-03-2020	7.5
04-01-2020	7.2	04-02-2020	6.9	04-03-2020	7.4
05-01-2020	7.0	05-02-2020	7.0	05-03-2020	7.5
06-01-2020	6.9	06-02-2020	6.9	06-03-2020	7.5
07-01-2020	7.0	07-02-2020	7.0	07-03-2020	7.4
08-01-2020	7.0	08-02-2020	6.9	08-03-2020	7.4
09-01-2020	7.2	09-02-2020	7.0	09-03-2020	7.4
10-01-2020	6.9	10-02-2020	7.0	10-03-2020	7.5
11-01-2020	7.0	11-02-2020	7.2	11-03-2020	7.3
12-01-2020	6.8	12-02-2020	7.2	12-03-2020	7.3
13-01-2020	7.0	13-02-2020	7.3	13-03-2020	7.4
14-01-2020	6.8	14-02-2020	7.3	14-03-2020	7.4
15-01-2020	6.9	15-02-2020	7.4	15-03-2020	7.3
16-01-2020	7.0	16-02-2020	7.3	16-03-2020	7.5
17-01-2020	7.2	17-02-2020	7.4	17-03-2020	7.5
18-01-2020	7.0	18-02-2020	7.4	18-03-2020	7.5
19-01-2020	7.0	19-02-2020	7.4	19-03-2020	7.6
20-01-2020	7.1	20-02-2020	7.4	20-03-2020	7.6
21-01-2020	7.2	21-02-2020	7.5	21-03-2020	7.5
22-01-2020	7.0	22-02-2020	7.5	22-03-2020	7.5
23-01-2020	7.2	23-02-2020	7.4	23-03-2020	7.4
24-01-2020	7.0	24-02-2020	7.5	24-03-2020	7.4
25-01-2020	6.8	25-02-2020	7.4	25-03-2020	7.5
26-01-2020	7.0	26-02-2020	7.4	26-03-2020	7.4
27-01-2020	6.8	27-02-2020	7.5	27-03-2020	7.5
28-01-2020	7.0	28-02-2020	7.5	28-03-2020	7.4
29-01-2020	7.0	29-02-2020	7.5	29-03-2020	7.3
30-01-2020	7.2			30-03-2020	7.5
31-01-2020	7.1			31-03-2020	7.5

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