



## GOVERNMENT OF KERALA

Industries (H) Department

No-IND-H3/251/2022-IND

04-03-2023, Thiruvananthapuram

From

The Principal Secretary to Government

To

The Registrar,

National Green Tribunal,

Faridkot House, Copernicus Marg, Near India Gate

New Delhi - 110 001

Sir,

Sub: Industries Department, Kerala - OA no. 502/2022 filed by Sri. Padmakumar before the Hon'ble NGT- Compliance report - Submitted - Reg

Ref: Order dated 29/08/2022 and 13/12/2022 of Hon'ble National Green Tribunal in OA No. 502/2022 filed by Sri. Padmakumar

I am to invite your attention to the reference cited and directed to forward herewith the Compliance report on behalf of the 1<sup>st</sup> Respondent (The Chief Secretary, Government of Kerala) and 2<sup>nd</sup> respondent (The Principal Secretary, Industries and Norka) in OA No. 502/2022 as directed by the Hon'ble National Green Tribunal.

Yours Faithfully,

M A RAJEENA BEEGUM  
ADDITIONAL SECRETARY

For Principal Secretary to Government.

**REPORT FILED ON BEHALF OF THE STATE OF KERALA BEFORE THE  
HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW DELHI IN  
OA NO.502/2022 FILED BY SRI.PADMAKUMAR**

Petitioner : Sri. Padmakumar

Respondents : The State of Kerala

Suman Billa IAS, aged 52 years , S/o, Sri. Venkiah Billa, Principal Secretary to Government, Industries Department & Norka, Kerala Government , Government Secretariat, Thiruvananthapuram

That I am the 2<sup>nd</sup> respondent in this OA. I am authorized by the 1<sup>st</sup> respondent to file report on behalf of State of Kerala in accordance with the Hon'ble NGT Order dated 13/12/2022.

M/s Kerala Minerals and Metals Limited (KMML), a Public Sector Undertaking of Government of Kerala is a fully integrated Rutile grade Titanium Dioxide Plant. Titanium Dioxide Pigment Unit of the Company was commissioned in 1984. KMML manufactures Titanium Dioxide from Ilmenite ore through the Chloride process. The Units in the Titanium Pigment Unit of the factory include Ilmentie Beneficiation Plant, Chlorination Plant, Oxidation Plant, Pigment finishing Unit etc. In Titanium Sponge Unit, KMML produces Titanium Sponge which have application in the aerospace industry & Defence applications.

M/s KMML unit is having an integrated consent to operate including authorization renewed on 13/9/2021 with validity up to 31/7/2025 for the production of 120 TPD TiO<sub>2</sub>.

Sri. Padmakumar , resident of Kollam District, Kerala has sent letter petition to Hon'ble NGT, which is treated and registered as original application alleging that M/s Kerala Minerals and Metals Ltd (KMML), a chemical industry in Kerala is polluting the land and water bodies of nearby village for about 30 years by discharging acid water. His contentions in the petitions were as follows;

- a. The area surrounding the factory has become unfit for any purpose.
- b. The villagers of Panmana, Kollam , Kerala were forced t o close drinking water wells as the wells were filled with acid.

- c. Cultivation is also not possible in the area.
- d. Lots of coconut trees fell due to corroded land.
- e. The industry is pumping acid waste directly to sea and connected lake through canals.
- f. Vattakkayal, a part of Ashtamudi, Vembanad lake in Porookkara is now filled with the acid clay waste polluting the environment and endangering life of the villagers.

Vide order dated 29.08.2022, the Hon'ble National Green Tribunal constituted a Joint Committee comprising of Principal Secretary (Industries & NORKA), Government of Kerala, CPCB, State PCB, State Wet Land Authority and Collector, Kollam and directed to submit factual and action taken report within one month and to send the copies of the report of the Joint Committee to the Project Proponent/ Statutory Authorities.

The Hon'ble National Green Tribunal in the order dated 13/12/2022 directed that the response by respondents 1 to 6 [ (1) State of Kerala through Chief Secretary, Government of Kerala, (2) Principal Secretary, Department of Industries & NORKA, State of Kerala, (3) State PCB, (4) Member Secretary, Kerala State Wetland Authority, (5) the District Collector, Kollam, and (6) the Project Proponent- M/s Kerala Minerals and Metals Ltd.,] to be filed within two months by e-mail, preferably in the form of searchable PDF/OCR supported pdf.

Smt. Sreekala.S, Chief Environmental Engineer, Kerala State Pollution Control Board, Thiruvananthapuram was entrusted as the Nodal Officer to co-ordinate the meetings of the committee and to file Report before the Hon'ble NGT.

The Joint committee held its meeting multiple times. The Committee heard the petitioner and enquired on his complaint. The Committee conducted site inspection and collected samples for analysis. The samples were analysed at Central Laboratory, KSPCB, Ernakulam and Regional Lab of Regional Directorate, CPCB, Bengaluru.

The site visit analysis report is as follows

- a. The stagnant water samples collected from the nearby areas of industry show acidic pH and presence of heavy metals. It is understood that the nearby area is polluted and the well water is not fit for drinking purpose.
- b. The storm water sample (KLMK11) of the industry show acidic pH and presence of Iron, Manganese and Vanadium which implies that the land

inside the industry is either polluted or there is a possibility of leakage / spillage of iron oxide sludge into nearby area including Vattakayal.

- c. The treated effluent sample from the industry shows total suspended solids and heavy metals above the limit specified which implies that the present treatment system is not adequate enough to comply with the effluent discharge standards and requires up gradation. The analysis results of the collected effluent discharge sample revealed that the parameters are exceeding the limit, permissible under the consent norms and also existing effluent treatment system consisting of neutralization using lime followed by settling tank, which is not adequate for removal of heavy metals and also to comply with the effluent discharge norm& Therefore the existing effluent treatment system should be upgraded to ensure compliance to the consent discharge norms.
- d. Based on the observations made during the visit that there is every chance of runoff from the existing iron oxide pond area especially during monsoon resulting pollution of nearby land. In Order to avoid this, scientific approach should he followed in line with the guidelines issued by CPCB from lime to time.
- e. The analysis results of the 14 tube well samples reveal that the pH of the tube well water samples were within a range of 5.7-7.6 and iron content is present in all the samples in the ranges of 0.1 mg/L to 53 mg/L and exceeding the prescribed limits of BIS Drinking Water Specification (IS 10500:2012) except at two locations. Manganese is present in two tube well water sample, whereas Lead is present in one of the sample of ground water and exceeding the prescribed limits (Mn:0.1 mg/l and Pb :0.0 1 mg/l of BIS Drinking Water Specification (IS 10500:2012).
- f. As per M/s. KMML, the depth of ground water in the tube well located within industry premises is around 250- 300 feet below ground level and probably this could be the reason all the tube well water do not show much contamination.
- g. The parameters such as iron, Manganese, end Vanadium 'were present in the iron oxide sludge sample. All these parameters were exceeding the limits (as per MoEF guidelines) in the stagnant samples collected front the nearby premises. It may be inferred that there i s every possibility of leakage or runoff from iron oxide sludge, from the company to the nearby premises

Recommendations of the Joint committee are the following.

1. The remedial measures both short term and long term already proposed by M/s KMML shall be implemented within the committed time limit. The existing effluent treatment system shall be upgraded to ensure compliance to the effluent discharge norms prescribed under the consent conditions within one year.
2. Integrated Consent to Operate issued to M/s KMML by Kerala SPCB shall be amended suitably with the necessary effluent discharge norms and hazardous waste management in accordance with the prevailing rules notified under The Environment (Protection) Rules, 1986 within a month.
3. Proper sign boards should be placed at all the suitable places to avoid human/ animal contact with the polluted stagnant water bodies in the vicinity of the human habitation- within a month.
4. Permanent capping of the existing storage ponds or shifting of entire hazardous waste to the CHWTSDF located nearby should be done in accordance with the Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016 as amended as well as guidelines issued by CPCB for capping of hazardous waste, if iron oxide sludge is not utilised completely.
5. Till such time, the existing old iron oxide ponds should be capped temporarily using LDPE liner (s) to avoid contaminated run off flow into the nearby low lying and residential areas. Suitable chemical dosage provision to neutralise run off also be made at all the end points of drains carrying run off, within the industry premises before next monsoon or by May 2023.
6. Untreated effluent generated from industry premises shall not be discharged into any drain or natural drain. Also, surface run off from old iron oxide ponds located within the industry premises should be stopped completely by way of constructing suitable size of a garland drain all along the industry premises and same may be connected to rainwater holding pond and excess flow to TS canal, provided free from contamination, within a period of nine months and along the periphery of old iron oxide ponds by March 2023. Also, the runoff should be neutralised if required, and ensured if required suitable and proper treatment, before its discharge.
7. Among the process changes, feasibility of inclusion of wash water option for recovery of acid (which should be recycled in the process) and neutralisation

of iron oxide sludge using suitable chemicals prior to the disposal of iron oxide sludge into storage tank – within three months.

8. Lime treatment in the existing dump yards and surface water contaminated areas as temporary measures shall be continued-on going.
9. Regular water supply and periodical health camps should be ensured by the company to the affected people-on going.
10. Existing iron oxide pond capacity is exhausted, the industry is required to take immediate action for temporary storage and its safe disposal in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended with immediate effect.
11. The R & D Options for utilisation of iron oxide sludge for recovery of iron through steel manufacturers required to be implemented within three months by obtaining requisite approvals from KSPCB and CPCB following the manifest as required under the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended, for which suitable conditions to be imposed and amended under the approvals granted to the industry by KSPCB. Also, M/s KMML may explore the option of recovery of red oxide from iron oxide sludge presently being followed by M/s DCW in Tamilnadu, within a period of three months.
12. Detailed assessment of affected areas in the vicinity of M/s. KMML need to be ascertained through institute of repute and option of remediation of contaminated site as well as ground water as well as feasibility of acquisition of affected land i.e., contaminated land nearby premises of M/s.KMML also be explored and implemented, for which time bound action plan to be submitted by M/s.KMML.
13. M/s. KMML also ensure compliance to the CPCB directions issued under Section 5 of The Environment (Protection) Act, 1986 in April 2012, for environmentally sound management of hazardous waste in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended.
14. All the tube wells located within the industry premises shall be connected with tamper proof flow meter to record total water consumption of natural resources within three months and proper records to be maintained and submitted to Kerala SPCB on quarterly basis.
15. M/s. KMML is required to install OCEMS and also a flow meter at the effluent outlet discharge into sea to assess compliance to the effluent

discharge norms prescribed under the Integrated Consent to Operate issued by Kerala SPCB under The Environment (Protection) Act, 1986. Also, OCEMS should be connected to Kerala SPCB server and also displayed at the entrance of the industry for information of general public, within five months.

Kerala State Pollution Control Board has filed status report before the Hon'ble NGT in the OA 502/2022. Also KSPCB requested KMML to furnish action taken report for the following consent conditions ;

1. Quality of treated effluent shall be within the tolerance limits.
2. Online pH measurement facility shall be provided at the outlet and maintain the records of the same.
3. Water meter shall be fixed to record the consumption of water
4. CAAQMS (Continuous Ambient Air Quality Monitoring Station) and OCEEMS (Online Continuous Effluent and Emission Monitoring System) shall be installed and shall be maintained

The Kerala State Wetland Authority reported to Government that Vattakkayal mentioned in the judgment, near M/s KMML is a part of the Kayamkulam and Pullikkal Wetland Complex which is included in the list of selected wetlands to be notified under the Wetlands (Conservation and Management) Rules, 2017, Kerala and that long term and short-term measures which have been proposed by M/s KMML as remediation which includes construction of Garland drain around the iron oxide and Effluent Treatment Ponds, solid waste management and Capping of existing storage ponds will curtail the flow of leachates into nearby water bodies. State Wetland Authority Kerala (SWAK) has requested KSPCB to include the Porookkara reach of Vattakkayal in the list of continuous water quality monitoring stations and directed KSPCB to monitor the activities of M/s KMML based on their action plan SWAK have given direction to M/s KMML to complete the proposed activities within the time frame stipulated in the Joint Committee Report.

Action Taken Report of KMML on the non- Compliance of the consent conditions suggested by Kerala State Pollution Control Board are as follows;

#### **1. Quantity of treated effluent shall be within the tolerance limits**

Effluents from all the process units are pumped to PNT. pH is monitored in the PNT and is maintained around 4-5 by addition of lime solution. Effluent from

PNT is further neutralized in SNT and pH is maintained at 7-8. Neutralized effluent is pumped to holding ETP pond. The supernatant liquid (treated water) in the pond is periodically pumped to sea. The supernatant liquid in daily analyzed in central lab (NABL Accredited) and its records are maintained and the copy of the monthly monitoring effluent analysis report is also submitted to KSPCB and CPCB. Remedial Measures taken for Effluent sludge management proposed by the Company are as follows;

Condition	Work Status	Target date	Remarks
<b>ETP Revamping/ Modernization</b>			
<b>Action - 1</b>			
ETP Revamping / Modernization	E-tendering of ETP revamping/ modernization DPR done on 10/02/2022. No offer received. Contacted parties for budgetary quote. The parties conveyed that they can proceed further only after signing an MOU. Being a public sector unit, KMML decided to go for re-tendering. E-tendering done for DPR preparation of ETP revamping/modernization. Three offers received and work order was awarded to M/S SBA Enviro System, Delhi and draft report got submitted by the party . After finalization of DPR, e-tendering will be done for ETP revamping/modernization with necessary approvals	Time frame set for final DPR submission - March 2023	2-3 years for completion

<b>Action 2</b>			
Tertiary tank installation in U-200-ENP	Installing a new tertiary tank in U200 for increasing the residence time of lime neutralization	One year	Soil testing of proposed site is over and civil foundation e-tendering activities are in progress
<b>Solid Waste Management of ETP sludge</b>			
<b>Action 1</b>			
Sales of ETP sludge	M/s Miracle Sands and Chemicals have been awarded the sale of ETP sludge for 10000 MT on 09/06/2020 and new sales order for 40,000 MT have been awarded on 08/04/2022. M/s Miracle Sands and Chemicals completed the shifting of 10000 MT of ETP sludge and as per the new sales order M/s Miracle Sands and Chemicals shifted approx 600 MT of ETP sludge from KMML to their facility at Tuticorin, Tamil Nadu KSPCB has renewed the permission granted to M/s Miracle Sands and Chemicals for collection of ETP sludge from KML, which is valid up to 31/3/2023	KSPCB authorization is valid up to March 2023	Exploring the possibility to use slurry pumping method coupled with hydro cyclones for speedy excavation of ETP sludge
<b>Action 2</b>			
	KMML identified M/s Renuka Equipments Pvt		

<p>Value addition of by products (Iron oxide/ETP sludge)</p>	<p>Ltd, Nagpur with the help of M/s NEERI, as the potential technology provider for the management of iron oxide stored in the old pond, by converting the same in to usable product. 234th Board meeting held on 04/04/2018 had given permission in principle for a detailed techno-commercial offer for setting up a pilot plant from M/s REPL .KMML had received offer from M/s REPL and evaluated. It was noticed that the proposed technology is not a field proven one and also involves investment around Rs. 400 crores on commercial scale set up. Hence the model of implementation was tried out in an alternative way by exploring Design, Finance, Build, Own, Operate DFBOO type contract.</p> <p>In order to select potential agencies to carry out value addition of iron oxide &amp; ETP sludge on DFBOO basis with suitable technology, KMML have published a global Expression of Interest and the last date to offer EOI</p>	<p>18-24 months from the date of order/statutory clearance</p>	<p>Government have directed the company to appraise the proposal before the board of the company again.</p>
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	<p>was on 15.03.2022. CSIR-NIIST ,Thiruvananthapuram was appointed as consultant to carry out the technical evaluation of the proposal and CSIR-NIIST have submitted their study report. Four offers were received through tendering , carried out further evaluation of proposal and short listed M/s Tetrabic India, Hyderabad, as the eligible bidder for both ETP and Iron oxide sludge refining value addition. 253rd Board Meeting of the company held on 31.10.2022 had accorded approval for the proposal and to seek final sanction from Government to cater agreement with the selected party on leasing KMMML land to the party for setting up their facility. The matter is under the approval process at Government level</p>		
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**2. Online pH measurements facility shall be provided at the outlet and maintained the records of the same.**

A pH meter already installed locally at the outlet of discharge pump and pH is displayed in the ETP MCC room. The pH details are daily recorded by water treatment plant of the company.

**3. Water meter shall be fixed to record the consumption of water**

Water meters are already installed for 16 tube wells and daily consumption of water is recorded by water treatment plant of the company.

#### **4.CAAQMS and OCEEMS shall be installed and shall be maintained.**

Seven CAAQMS stations are installed at various locations of KMML (inside and outside) as per KSPCB Consent Condition for continuously monitoring the ambient air quality parameters such as NO<sub>x</sub>, H<sub>2</sub>S, SO<sub>2</sub>, CO, PM<sub>2.5</sub> & PM 10. The real time data is connected to the central server of the KSPCB through M/s. GLens Software. The CAAQMS data are also displayed in LED display boards installed in front of company and inside TSP unit near Government school.

Regarding OCEEMS installation, KMML reported that company explore the possibility of a device compatible to the effluent of KMML. With the identification of a proper instrument, company will be implementing the same as per the guideline of KSPCB within the stipulated time.

KMML prepared the schedule for both short term and long term measures to mitigate environmental impacts as suggested by M/s NEERI and got approval of KSPCB. Action plan and current status details on various term measures taken by KMML is as shown below;

#### **Short term Measures**

Item	Work Status	Target	Remarks
Construction of garland drain around the iron oxide (IOP)/ETP ponds	After opening e-tendering work order for the construction of Garland drain around new ETP/IOP and old ETP/IOP was issued to M/s Ravi Kumar & M/s Biohomes on 08.10.2019 and 08.04.2021 respectively. The period of contract was extended due to events such as adverse climatic condition, restriction imposed as part of pandemic COVID 19 lock down, local labour issues, ETP sludge shifting process etc. The works are now progressing at site.	March 2023 (NEW ETP)  May 2023 (OLD ETP/IOP)	About 80% of garland drain construction around New ETP and 40% around Old ETP/IOP has been completed. Installation of garland pump in the new ETP pit is in progress
	E-Tender was invited for the Test patch for remediation of contaminated area inside KMML premises and its consultancy		

<p>Remediation of affected land near KMML premises.</p>	<p>works on 09.07.2019. No parties quoted. Action for limited tender for consultancy work taken on 07.08.2019. Two parties quoted the tender. Work order was issued to M/s FEDO on 05.12.2019 for consultancy and supervision of the test patch area for contaminated land in KMML premises.</p> <p>M/s FEDO have submitted a detailed project report with schematic drawing and lay out of the contaminated land remediation work. Tendering for test patch done in three occasions i.e, 25.02.2020 (only single offer received), 24.06.2020 &amp; 19.08.2020 (no party quoted).</p> <p>Due to non receipt of offers, action for doing the activity on trial basis has been initiated by inviting open e -tender. Accordingly land preparatory works for the test patch area completed and tendering activities for the remediation of the test patch area is in progress .</p>	<p>Time Frame Set is One year for test patch (May 2023)</p>	<p>Land preparation for the Test Patch unit completed and tendering activities for the remediation of the test patch area is in progress</p>
	<p>Considering the constraint for shifting the entire quantity of sludge to newly proposed containment system and limitation of vacant land availability, another technological option was identified by KMML through US based Titanium technology</p>		

<p>Solid waste management in KMML (in-situ/Ex-situ storage) - Geotube as a trial implementation</p>	<p>consultant.                  The new technology involves dewatering and storage of solid waste using GEOTUBES which was presented to KSPCB in the meeting held on 10/12/2018. In principle approval was received and directed to submit details of the proposal. Tendering action for the Geotube iron oxide containment from New elevated iron oxide pond was done . Company received two Offers &amp; the same got placed before the board meeting of the company for approval.                   Subsequently, Geotube suppliers had intimated KMML to get environmental clearance to submit offer for the tender. KMML submitted a request letter to KSPCB on 23/02/22 for Environmental clearance approval to go ahead with the collection and containment of Iron oxide slurry in Geotubes from the elevated new iron oxide pond as trial phase activity. Dewatered Iron oxide solids can safely be transferred to offsite after the containment. A presentation of solid waste management using Geotube was conducted att the Chamber of Chairman, KSPCB on 16/5/2022 and 14/10/2022. KMML officials visited CPCB, New Delhi on 28/11/2022 and</p>	<p>Time set is One year after getting approval from CPCB/KSPCB and subsequent ordering</p>	<p>Stage - 1 of this work can be completed in a period of 8-10 months                   Government directed KMML that Board shall take a decision in the Project proposal of KMML on "Collection &amp; containment of iron oxide in Geo tubes" after getting the views of Independent / Professional Directors of the company and with the Approval of Central / State PCB shall be obtained as per the guidelines in force.</p>
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	<p>handed over the request letter for obtaining authorization for conducting trial geotube filling and containment of iron oxide from new elevated iron oxide pond. VC meeting /technical presentation was conducted on 3/1/2023 with CPCB officials and queries were addressed, awaiting clearance .</p> <p>Work can be started only with the technical concurrence of CPCB/KSPCB. Also awaiting Government final sanction to place order.</p>	
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### Long Term Measures

Item	Work Status	Target	Remarks
Acid Regeneration Plant (ARP) technology modification to generate saleable iron oxide.	<p>Tender was invited and opened in September 2019 &amp; only one party quoted .Tender was closed on December 2019 and after evaluation of the proposal, the file was put up to the Board for approval. 243th Board Meeting of the company held on 27.05.2020 had accorded approval for seeking final Government sanction.</p> <p>As per Government direction, retendering done on June 2021.</p> <p>Global Tender was invited from technology providers for the process modification of existing Acid Regeneration Plant on 10.06.2019. The offer submitted by M/s INDROX GLOBAL PVT LTD is evaluated, approved in the 250<sup>th</sup></p>	18 months from order date	The proposal is under consideration of Government.

	Board of meeting held on 15.01.2022 and submitted for Government approval. The matter is under consideration of Government.		
Value addition of by products (Iron oxide / ETP sludge)	<p>KMML identified M/s Renuka Equipments Pvt Ltd, Nagpur, with the help of M/s NEERI, as the competent technology provider for the management of iron oxide stored in the old pond, by converting the same in to usable product. 234th Board meeting held on 04.04.2018 had given permission in principle for receiving a detailed techno-commercial offer for setting up a pilot plant from M/s REPL. KMML have received offer from M/s REPL and evaluated. It is noticed that the proposed technology is not a field proven one and also involves investment around Rs 300- 400 Crores on commercial scale set up.</p> <p>In order to select potential agencies to carry out value addition of iron oxide &amp; ETP sludge on a total responsibility basis with suitable technology, KMML have published a global Expression of Interest and the last date to offer was 15.03.2022. Offers are received from parties and CSIR-NIIST, Thiruvananthapuram was appointed as consultant to carry out the technical evaluation of the proposal. CSIR-NIIST have submitted their study report . Tender was invited , Board approval obtained for awarding</p>	18-24 months from the day of order /statutory clearance	Government directed company to place the proposal before the board of the company again to examine the project again as there are other two projects which have been submitted to rectify the filled up iron oxide Sludge

order to the selected parties , awaiting Government approval for final order placement.		
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## Other actions initiated by KMML

Item	Work Status	Target	Remarks
Iron Oxide residue Sales	<p>KMML invited e-tender for the sales of iron oxide residue for further process/value addition at end user on 19.12.2019. M/s Miracle sands and Chemicals, Tuticorin quoted for the tender and sales order was issued to the party on 09.06.2020, for shifting 10,000 MT to the end user end.</p> <p>Sales order of iron oxide sludge was extended for obtaining statutory approvals from TNPCB and KSPCB. M/s Miracle sands and Chemicals, Tuticorin has already submitted a detailed project proposal for manufacturing Iron Oxide Concrete bricks along with the consent order from TNPCB valid up to March 2025 and the Sale Order of Iron Oxide residue (10000MT) issued by KMML on 9/6/2020.</p> <p>In the meeting held on 19/9/2022 in KSPCB head office ,Thiruvananthapuram KMML requested KSPCB sanction to shift 10000MT of Iron Oxide to carry out trial runs as per Hazardous Waste Management and Transboundary Movement Rules 2016 Chapter II, Section No.9, Sub Division 2. KSPCB informed KMML that a letter was</p>	18-24 months from the date of statutory clearance	<p>CPCB concurrence to be got for transfer of Iron Oxide to M/s Miracle sands and Chemicals, Tuticorin</p>

	<p>forwarded to CPCB on 24/9/2022 for seeking their advice on conducting a trial.</p> <p>KMML officials visited CPCB on 28/11/2022 and made follow up for obtaining authorization for trial production of Iron Oxide bricks by M/s Miracle sands and Chemicals, Tuticorin . CPCB officials informed that authorizat on request from KMML will be included in the next committee meeting held on January 2023</p>		
ETP sludge sales	<p>E-tender was invited by KMML for shifting 10,000 MT of ETP sludge from ETP pond on 04.02.2020 and subsequently the quantity enhanced from 10000 MT to 50000 MT on 17.02.2020. Sales order was issued to M/s Miracle sands and Chemicals on 09.06.2020. for 10000MT.A new Sales Order was issued to M/s Miracle Sands and Chemicals for 40000 MT on 8/4/2022. Shifting of 10000MT of ETP sludge from KMML have been completed and started shifting of ETP sludge of 40000MT as per the new sales order. Permission from KSPCB granted to M/s Miracle sands and Chemicals, Tuticorin for collection and transportation of ETP sludge from KMML which is valid up to 31/3/2023.</p>	ongoing	<p>Shifting of ETP sludge of 10000MT have been completed and started shifting of sludge of 40000MT and work order was valid up to 31/3/2023</p>
	<p>E-tendering of ETP revamping/modernization DPR done on 10/02/2022. No offer received. Contacted parties for budgetary quote. The parties conveyed that they can</p>	Time frame set	<p>After finalization of DPR e-tendering will</p>

ETP Revamping / Modernisation	proceed further only after signing an MOU. Being a public sector unit, KMML decided to go for retendering. E tendering done for DPR preparation of ETP revamping / modernization. Three offers received and work order was awarded to M/s SBA Enviro System, New Delhi and draft report got submitted by the party .	for final DPR submission - March 2023	be done for ETP Revamping / Modernisation with necessary approvals
Capping of existing storage ponds	Tendering activities for capping of settling pond 1 at eastern side is under progress. E tender invited and file processing is under progress for awarding work order	Time frame for tendering and capping April 2023	Activities for awarding work order in progress
Utilization of Iron oxide by making Iron Sinter - Value addition of iron Oxide	<p><b>In-house Value addition of Iron Oxide</b></p> <p>Plant trial for a quantity of 10 MT of iron oxide conducted on 23rd Nov 2022. The trail was found successful and Company is able to produce iron sinters.</p> <p>The sinters produced are chloride free and agglomerated, which was confirmed by outsourcing analysis at NIIST and STIC.</p> <p>The quality has to be confirmed by the prospective iron industry for using as raw material for iron industry. KMML iron sinter samples were given to two steel TMT making industries for conducting plant trial and plant initial trials were found successful.</p>	Time Frame for setting up of a plant in KMML - Dec 2023	KMML are providing samples to the different iron industry for checking the suitability. Patent filed in 2022.
Utilization of Iron Oxide by	Another plant trial for the production of DRI pellets from the iron oxide is	Time	

making DRI/Sponge Pellets - Value addition of iron Oxide	planned. If successful, further value addition of iron oxide is possible.	frame to be decided after the trial	patent filed in 2022.
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Action Report submitted by the M/s KMML on the recommendations of the Joint Committee report are as follows;

Sl. No.	Findings of Joint Committee	Status	Remarks
1	The remedial measures both short term and long term already proposed by M/s KMML shall be implemented with in the committed time limit.	Latest ATR for both short term and long term have been submitted to Government.	Short Term & Long Term measures with time frame
2	The existing effluent treatment system shall be upgraded to ensure compliance to the effluent discharge norms on consent conditions within one year.	company have submitted report on consent conditions (ATR on non-prescribed under the consent conditions as detailed above)	2-3 years for ETP Revamping/modernization completion. 6 months for Tertiary tank installation
3	Integrated Consent to Operate issued to M/s KMML by Kerala SPCB shall be amended suitably with the necessary effluent discharge norms and hazardous waste management in accordance with the prevailing rules notified under The Environment (Protection) Rules, 1986	-do-	ATR on non-compliance of consent conditions as detailed above.

	within a month.		
4	Proper sign boards should be placed at all the suitable places to avoid human/ animal contact with the polluted stagnant water bodies in the vicinity of the human habitation- within a month.	Proper sign boards will be placed at all the suitable places to avoid human/animal contact with the polluted stagnant water bodies in the vicinity of the human habitation.	Display boards will be placed within one month
5	Permanent capping of the existing storage ponds or shifting of entire hazardous waste to the CHWT/SDF located nearby should be done in accordance with the Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016 as amended as well as guidelines issued by CPCB for capping of hazardous waste, if iron oxide sludge is not utilised completely. Till such time, the existing old iron oxide ponds should be capped temporarily using LDPE liner (s) to avoid contaminated run off flow into the nearby low lying and residential areas. Suitable chemical dosage provision to	Pond capping is being done for the Settling pond - 1 area 4000 m2 with HDPE film  Action initiated for capping existing old ponds with HDPE films	Capping of setting pond-1 area 4000 m2 with HDPE film will be completed by March 2023  capping existing old ponds be done before next Monsoon or by May 2023.

	<p>neutralise run off also be made at all the end points of drains carrying run off, within the industry premises before next monsoon or by May 2023.</p>		
<p>6</p>	<p>Untreated effluent generated from industry premises shall not be discharged into any drain or natural drain. Also, surface run off from old iron oxide ponds located within the industry premises should be stopped completely by way of constructing suitable size of a garland drain all along the industry premises and same may be connected to rainwater holding pond and excess flow to TS canal, provided free from contamination, within a period of nine months and along the periphery of old iron oxide ponds by March 2023. Also, the runoff should be neutralised if required, and ensured if required suitable and proper treatment, before its discharge.</p>	<p>Action initiated for cleaning all the drain and natural drain within company premises and for constructing delay pits for ensuring uncontaminated discharge About 80% of garland drain construction around new ETP and 40% around old ETP/IOP has been completed. Installation of garland pump in the new ETP pit is in progress</p>	<p>Within a period of nine months  garland drain construction around new ETP will be done by  March 2023  garland drain construction around Old ETP /IOP will be done by  May 2023</p>
		<p>The process changes, feasibility</p>	

7	<p>Among the process of inclusion of changes, feasibility of inclusion of wash water option for recovery of acid (which should be recycled in the process) and neutralisation of iron oxide sludge using suitable chemicals prior to the disposal of iron oxide sludge into storage tank – within three months.</p>	<p>of inclusion of wash water option for recovery of acid (which should be recycled in the process) and neutralization of iron oxide sludge using suitable chemicals prior to the disposal of iron oxide sludge into storage tank possibility study will be explored.</p>	<p>Within three months</p>
8	<p>Lime treatment in the existing dump yards and surface water contaminated areas as temporary measures shall be continued-on going.</p>	<p>Lime treatment in the existing dump yards as a temporary measures being done periodically</p>	<p>on going</p>
9	<p>Regular water supply and periodical health camps should be ensured by the company to the affected people-on going.</p>	<p>KMML is continuously supplying about 7 to 8 lakh liters per day of drinking water of portable quality to the surrounding local residences. Potable water is supplied through pipeline around 65 kms for local residence and also in tankers. Conducting</p>	<p>Daily supply</p>

		regular medical camps once in a month and providing medicines, medical aid to ailing patients / palliative care	
10	Existing iron oxide pond capacity is exhausted, the industry is required to take immediate action for temporary storage and its safe disposal in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended with immediate effect.	Temporary storage are for safe disposal of iron oxide is being done in accordance with the Hazardous and other Waste (Management and Transboundary movement) Rules, 2016 as amended	The disposal of iron oxide to common TSDF activity was kept in abeyance from 13/08/2014 as directed by the Kerala State Government. KSPCB suggested for shifting of Iron Oxide to KEIL. The recommendation of KSPCB to shift the Iron Oxide sludge is under consideration of Government as Company informed that shifting of Iron Oxide is costly.
		In House R&D - Value addition of Iron Oxide  Utilization of Iron Oxide by making Iron Sinter - Value addition of Iron Oxide  Plant trial for a quantity of 10MT of iron oxide conducted on 23rd Nov, 2022.  The trail was	

11	<p>The R &amp; D Options for utilisation of iron oxide sludge for recovery of iron through steel manufacturers required to be implemented within three months by obtaining requisite approvals from KSPCB and CPCB following the manifest as required under the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended, for which suitable conditions to be imposed and amended under the approvals granted to the industry by KSPCB. Also, M/s KMML may explore the option of recovery of red oxide from iron oxide sludge presently being followed by M/s DCW in Tamilnadu, within a period of three months.</p>	<p>found successful and company could produce iron sinters. The sinters produced are chloride free and agglomerated, which was confirmed by outsourcing analysis at NIIST and STIC. The quality has to be confirmed by the prospective iron industry for using as raw material for iron industry. KMML iron sinter samples were given to two steel TMT making industries for conducting plant trial and the plant initial trials were found successful</p> <p><u>Utilization of Iron oxide by making DRI/Sponge pellets</u></p> <p>Two stage plant trial conducted for production of DRI pellets from the</p>	<p>Time Frame for setting up of a plant in KMML - December 2023</p>
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		iron oxide on 15/02/2023 & 20/02/2023 and was found successful. Sample pellets were given to M/s Autocast, PSU in Kerala for detailed analysis.	
12	Detailed assessment of affected areas in the vicinity of M/s. KMML need to be ascertained through institute of repute and option of remediation of contaminated site as well as ground water as well as feasibility of acquisition of affected land i.e., contaminated land nearby premises of M/s.KMML also be explored and implemented, for which time bound action plan to be submitted by M/s.KMML.	M/s NEERI 's study was done in KMML on 2015.	KMML will conduct assessment of the affected area and furnish time bound action plan later.
	M/s. KMML also ensure compliance to the CPCB directions issued under Section 5 of The Environment (Protection) Act, 1986 in April 2012, for environmentally	KMML is periodically submitting Action Taken Report to CPCB as per the direction issued under section 5 of The Environment (Protection) Act, 1986 in April 2012,	Action Taken Report submitted once in two

13	sound management of hazardous waste in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended.	for environment sound management of Hazardous and other waste (management and Transboundary movements) Rules, 2016 as amended	months to the Chairman, CPCB, New Delhi.
14	All the tube wells located within the industry premises shall be connected with tamper proof flow meter to record total water consumption of natural resources within three months and proper records to be maintained and submitted to Kerala SPCB on quarterly basis.	Water meters are already installed for 16 tube wells and daily consumption of water is recorded by water treatment plant of the company	Monthly water consumption report is being submitted to KSPCB. Quarterly report of total water consumption of natural resources will be submitted to KSPCB by KMML within three months
15	M/s. KMML is required to install OCEMS and also a flow meter at the effluent outlet discharge into sea to assess compliance to the effluent discharge norms prescribed under the Integrated Consent to Operate issued by Kerala SPCB under The Environment (Protection) Act, 1986. Also, OCEMS	A pH meter is already installed locally at the outlet of discharge pump and pH is displayed in the ETP MCC room. The pH details are daily recorded by water treatment plant of KMML. Regarding OCEMS installation, KMML explore the possibility of a device compatible	Within five months

<p>should be connected to Kerala SPCB server and also displayed at the entrance of the industry for information of general public, within five months.</p>	<p>to the effluent of KMML. With the identification of a proper instrument, KMML will implement the same as per the guideline of KSPCB within the stipulated time,</p>
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It is respectfully submitted that Government have already directed the Company to implement the Short Term & Long Term measures in time bound manner. The status report furnished by the Company, shows that company took steps to implement short term/ long term measures in terms of pollution control measures. Government have directed KMML to furnish ATR on the recommendations in the Joint committee Report. Out of the consent conditions of KSPCB which are non- fulfilled, except OCEMS installation, Company have taken measures for fulfilling the consent conditions. With regard to OCEMS installation, KMML informed Government that KMML will explore the possibility of a device compatible to the effluent of KMML for installation of the same and company have expressed the possibility for identification of the same within 5 months. The recommendations of the Joint Committee noted that the Iron Oxide pond 's capacity is exhausted. Company have taken measures for capping pond-1 area 4000 m<sup>2</sup> with HDPE film and for capping existing old ponds . Regarding the recommendation of Joint Committee to take immediate action for temporary storage and its safe disposal in accordance with the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 as amended with immediate effect, KMML. Company informed Government that Iron oxide sludge shifting to KEIL will incur a huge cost and the matter is under examination by Government. Company's R&D wing examines the possibility of value addition of Iron Oxide sludge for making Iron Sinter and DRI/Sponge pellets

The Short Term & Long Term measures to be taken by KMML will be implemented in a time bound manner and the company will also take steps to comply with the recommendations of Joint Committee to fulfill the consent conditions suggested by KSPCB.

All the facts stated above are true to the best of my knowledge, information and belief.

Dated this the 4<sup>th</sup> day of March 2023

  
  
**SUMAN BILLA IAS**  
Principal Secretary  
Industries & NORKA Dept.  
Government of Kerala  
Secretariat, Thiruvananthapuram