

**Central Pollution Control Board**  
**Waste Management - II Division, Delhi**

**Sub: Minutes of the 21<sup>st</sup> meeting of the Technical Expert Committee organized virtually through mail for “Evaluation of proposal for utilization of the hazardous and other wastes under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016”.**

1. 21<sup>st</sup> meeting of Technical Expert Committee (TEC) for “Evaluation of proposals received from the various industries for utilization of the hazardous and other wastes under Rule 9 of Hazardous and Other Wastes (Management and Transboundary Movement) (HOWM) Rules, 2016” was organized virtually through mail in the third week of October, 2020.
2. The committee members were requested to provide their comments on 02 draft Standard Operating Procedures (SoPs), 02 proposals for revision in existing SoPs, 05 draft trial run protocols and 01 general issues under Rule 9, vide mail dated 22.10.2020. List of the committee members requested to provide their comments is enclosed at Annexure A.
3. The committee members provided their suggestions and feedbacks through mail.
4. The details of the 02 Draft SoPs along with the recommendations are as below:

Sl. No.	Details of the Draft SoP	TEC Recommendation
1.	SoP for Utilization of Sludge (from spent acid neutralization facility of CETP) for manufacturing of bricks	<p>Upon detailed examination, the committee provided suggestion/feedback such as:</p> <ol style="list-style-type: none"> <li>1. Curing of bricks shall be allowed with treated water when it meets good quality standard (i.e. treated effluent quality standards issued by MoEF&amp;CC vide notification dated 1<sup>st</sup> January, 2016) &amp; its analysis report to be submitted quarterly and sludge from curing pit shall goes back to CETP for treatment.</li> <li>2. Minimum 30 days requirement of storage capacity of CETP sludge and other raw material.</li> <li>3. Standards of fugitive emission decided for PM<sub>10</sub>.</li> <li>4. TCLP/STLC test of the sludge bricks shall be carried out after curing of the bricks and before using it or selling it for construction.</li> </ol> <p>In view of above, the committee recommended that, after incorporating above information and suggestions, SoP shall be finalized</p>
2.	SoP for Utilization of ETP Sludge (from secondary clarifier) as fuel in Recovery Boiler	<p>Upon detailed examination, the committee observed that the utilization of ETP Sludge (from secondary clarifier) should be allowed for captive consumption, as at this stage, preference of siting should be given to utilize inside factory premises i.e., Integrated Paper Mill where recovery boiler has been installed with already existing pollution control devices.</p>

		In view of above, committee recommended that after incorporating above suggestions the SoP for Captive utilization of ETP Sludge as fuel in Recovery Boiler shall be finalized.
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5. The details of the 02 proposals for revision in existing SoPs along with the recommendations are as below:

Sl. No.	Details of the SoP	TEC Recommendation
1.	Revision of existing SoP for “Utilization of spent ion exchange resin generated from demineralization (DM) plant” in Pulverized Fire Coal (PFC) boiler of Thermal Power Plant by M/s KSK Mahanadi Power Company Limited, Chhattisgarh.	<p>Upon detailed examination, the committee observed that the utilization proposed by M/s KSK Mahanadi Power Company Limited, Chhattisgarh for the use of spent ion exchange resin for energy recovery in captive boilers (i.e. Pulverized Fire Coal) is almost similar in nature of CPCB existing SoP for utilization of spent ion exchange resin generated from demineralization plant in stoker fired boiler.</p> <p>However, unit need to install Flue Gas Desulphurization (FGD) as proposed in their presentation for treatment of SO<sub>2</sub> in the emissions and SO<sub>2</sub> for online emission analyzer shall also be added in Para 29.9 of existing SoP.</p> <p>Therefore, committee recommended, the request of the concerned unit for use of spent ion exchange resin in Pulverised Fire Coal boilers may be considered and after incorporating above suggestions, SoP shall be finalized.</p>
2.	Revision in existing SoP of “Utilization of SPL generated from primary Aluminium Smelters” (regarding standardization of patent process of detoxification of Spent Pot Lining (SPL) by controlled heat treatment by M/s Green Energy Resources, Odisha)	<p>Upon detailed examination, the committee observed that the trial run of the detoxification of SPL was conducted by CPCB and OSPCB authorities during October 2016 and published Standard Operating Procedure and checklist of Minimal Requisite Facilities for utilization of Spent Pot Lining (SPL) generated from Primary Aluminium Smelting Industries’ in March 2017 as per HOWM Rules 2016.</p> <p>The process of detoxification was established and authorization granted to concerned unit for commercial detoxification process by CPCB/OSPCB Authorities, which is valid till 31<sup>st</sup> March, 2023.</p> <p>In view of judgement of High Court of Odisha, Cuttack (WP(C) no 26-407/2020) on the subject of patent granted to M/s Green Energy Resources, TEC decided to await the outcome of hearing given to M/s Green Energy Resources, Odisha before Odisha State Pollution Control Board.</p>

6. The details of the 01 general Rule 9 related issue alongwith the recommendation is as below:

Sl. No.	General Rule 9 issues discussed	TEC Recommendations
1	Representation for the manufacturing of Zinc Sulphate Hepta Hydrate and Zinc Sulphate Mono Hydrate from Zinc ash by M/s Agrosun Zinc Products Pvt Ltd, Bangalore.	<p>Upon detailed examination, the committee observed that for the process of manufacturing Zinc Sulphate Hepta Hydrate and Zinc Sulphate Mono Hydrate from Zinc ash, a guideline of CPCB under Scheduled-IV is already available, but the unit's proposed process is deviating from the process described in the guideline.</p> <p>As there are variations and deviations in the process for manufacturing of various variants of the product from the Zinc Ash, which are not seems to be available in the existing guideline, therefore separate specific SOPs are required to be developed with consideration of altered process, products and mass balance.</p> <p>In view of above, committee recommended that application of M/s Agrosun Zinc Products Pvt Ltd, Bangalore under Rule 9 of HOWM Rules, 2016 may be considered for conducting trial run.</p>

7. The details of the 05 draft trial run protocols along with the recommendations are given in **Annexure-B**. In addition to that, an expert member also proposed that period of trial run may be allowed minimum for 7 days and maximum for two months depending on the stabilization of utilization process and it was also suggested that the consumption of electricity per ton of utilization of hazardous waste should be introduced as a parameter (i.e. meter reading to be taken: units consumed during the trial run for processing of certain quantity of waste) for all draft trial run protocols so that in the future this can be verified as one of the cross check, whether the industry is actually utilizing the waste in their reprocessing / recycling unit or trading it somewhere.

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**CENTRAL POLLUTION CONTROL BOARD  
DELHI- 110 032**

**List of Participants for virtual meeting**

<b>Sl. No</b>	<b>Name</b>	<b>Designation and Organization</b>	<b>Member of the Committee / Invitee</b>
1.	Dr. R.K. Singh	Retired Scientist 'F', Bureau of Indian Standard, New Delhi	Chairman
2.	Dr. C.S. Sharma	Ex. Additional Director, CPCB, Delhi	Member
3.	Prof. Rajeev Gupta	Department of Chemistry, University of Delhi, Delhi	Member
4.	Prof. Kamal Kishore Pant	Department of Chemical Engineering, IIT Delhi	Member
5.	Dr. A K Swar	Chief Environmental Engineer, State Pollution Control Board, Odisha	Member
6.	Sh. D. M. Thaker	Unit Head, Hazardous Waste Cell, Gujarat Pollution Control Board, Gandhi Nagar, Gujarat	Member
7.	Sh. B. Vinod Babu	Additional Director & Head, WM-I, CPCB, Delhi	Member
8.	Sh. Dinabandhu Gouda	Additional Director & Head, IPC-I, CPCB, Delhi	Member
9.	Sh. Abhey Singh Soni	Additional Director & Head, WM-II, CPCB, Delhi	Member Convener
10.	Sh. Anil C. Ranveer	Additional Director, WM-II Div, CPCB, Delhi	Invitee
11.	Sh. Mohd Salik	Senior Research Fellow, WM-II Div, CPCB, Delhi	Invitee
12.	Sh. M. V. Srinivas	Junior Research Fellow, WM-II Div, CPCB, Delhi	Invitee

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**Recommendation of the Expert Committee for approval of proposals under  
Rule 9 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.**

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
1.	M/s Anand Chloride, Madhya Pradesh	Spent HCl generated from scrubber of glass manufacturing industry considered as hazardous waste category – A41001 Part A, Schedule III of HOWM Rules, 2016.	Calcium Chloride	The utilization process involves addition of calcium carbonate and spent hydrochloric acid (18-19%) in the reaction vessel, where calcium chloride is formed. The said reacted mass is neutralized by addition of lime in the neutralization tank. The addition of HCl is adjusted that almost a neutral solution of calcium chloride is obtained. The clear solution of calcium chloride, thus obtained is decanted from the tanks. The solution is transferred to evaporators, which are heated directly by using coal as fuel. Suitably concentrated solution is then taken to the crystallizer. The product is then crystallized and dried.	The committee recommended trial run permission may be granted with following conditions: <ul style="list-style-type: none"> <li>i. Hazardous waste (Spent HCl) shall be analysed for pH, Purity of HCl/Total acidity, Moisture, TOC, COD, Silica, Free chlorine and Heavy metals ( Pb, As, Hg)</li> <li>ii. Product (Calcium Chloride) manufactured with utilisation of Spent HCl shall be analysed for COD, TOC, Specific gravity, Chlorides, Matter insoluble, CaCl<sub>2</sub>, MgCl<sub>2</sub>, Alkalinity and TOC.</li> <li>iii. Waste water i.e. condensate water shall be analysed for pH, COD, TDS and Chlorides.</li> <li>iv. Fugitive emission shall be monitored for HCL Mist, Chlorine, PM<sub>10</sub> and Silica.</li> <li>v. Source emission shall be monitored for HCl Mist, Chlorine, TOC and PM at reaction vessel and only PM at granulator.</li> </ul>
2.	M/s Evergreen Recycleka ro (I) Pvt. Ltd.,	Lithium Batteries of Mobile Phones are listed at item no B1090, Part - B of Schedule III under HOWM Rules, 2016	Recovery of metals (Co, Ni, Mn, Li, Cu, Al)	Lithium ion Batteries which constitutes metals like Cobalt (Co), Nickel (Ni), Manganese (Mn), Lithium (Li), Copper (Cu), Aluminium (Al), etc. The black cathodic material inside the batteries contains higher composition of Co along with Mn, Ni, Li, Cu & Al. Hydrometallurgy technique has been proposed for recycling of the Li ion mobile batteries. The recycling process consist of following steps,	The committee recommended trial run permission may be granted with following conditions: <ul style="list-style-type: none"> <li>i. Recovered products (metals) manufactured with utilisation of Lithium Batteries shall be analysed by TCLP / STLC test for Cd, Co, Cr, Cu, Ni, Zn, Mn, Fe and Fluoride.</li> <li>ii. Scrubbed water and residue from scrubbers shall be analysed for Cd, Co, Cr, Cu, Ni, Zn, Mn, Fe and Fluoride.</li> <li>iii. Fugitive emission shall be monitored for PM<sub>10</sub>,</li> </ul>

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
				<ul style="list-style-type: none"> <li>Discharging &amp; Crushing of Batteries</li> <li>Leaching &amp; Iron precipitation of the Black powder (Cathodic Material from batteries)</li> <li>Separation &amp; purification of the metals by Solvent Extraction Technique</li> </ul>	<p>CO, HF, Acid (H<sub>2</sub>SO<sub>4</sub>) Mist and Heavy Metals (Co, Ni, Mn, Zn, Cd, Cu, Fe).</p> <p>iv. Source emission shall be monitored for PM, HF, CO, Acid (H<sub>2</sub>SO<sub>4</sub>) Mist and Heavy metals (Co, Ni, Mn, Zn, Cd, Cu, Fe).</p>
3.	M/s National Construction, Uttarakhand	ETP sludge generated from the secondary treatment process of ETP in automobile industry is recognized as hazardous waste under the category – 35.3 of Schedule I of HOWM Rules, 2016	Paver block/bricks/Tiles	ETP sludge is mixed in mechanical mixer with cement, fine aggregates, coarse aggregate and water. The proposed composition of ETP sludge, cement, fine aggregates, coarse aggregate and water will be 10%, 14.88%, 22.90%, 45.98% and 6.24% respectively. Fill the mixture in the mould and the plastic moulds containing mixture are then kept into vibro paver block machine for compaction for 1-2 min residence time at ambient temperature. These moulds containing paver block mixture are then kept for setting for 24 hrs in summers & 48 hrs in winters in shed with concrete flooring. After completion of setting process paver block are removed from plastic molds and then kept in to RCC water tank for minimum 28 days to obtain proper concrete strength / paving block is cured at relative humidity over 90% at room temperature for 28 days	<p>The committee recommended trial run permission may be granted with following conditions:</p> <p>i. Hazardous waste (ETP sludge) shall be analysed for Moisture Content, pH, Total concentration of Heavy metals (Cr, Cd, Cu, Ni, Pb, Zn, As, Mn) and Total Organic Compounds.</p> <p>ii. Product (Calcium Chloride) manufactured with utilisation of Spent HCl shall be analysed for Total leachable concentration of Heavy metals (Cr, Cd, Cu, Ni, Pb, Zn, As, Mn), Comprehensive strength, Water absorption, Efflorescence and Drying shrinkage.</p> <p>iii. Waste water shall be analysed for pH, BOD, COD, Total Suspended Solids, Oil and grease, Heavy Metals (Cd + As + Pb + Cr + Cu + Mn + Ni + Zn).</p> <p>iv. Fugitive emission shall be monitored for PM<sub>10</sub>.</p>
4.	M/s Rana Enterprises, Himachal Pradesh	Used Oil and off specification products listed at item no 5.1 28.4 of Schedule I respectively under	Refurbished oil, shampoo, creams and	Waste oil undergoes pretreatment, centrifugation and dehydration where the water oil and sludge get separated. The sludge generated will be sent to TSDF and collected water will be treated in ETP. The	<p>The committee recommended trial run permission may be granted with following conditions:</p> <p>i. Residue generated from processing of used oil, effluent from ETP and Recycled &amp; other final products shall be analyzed for the following: -</p>

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
		HOWM Rules, 2016	detergents.	<p>refined oil will be sold to Tyre manufacturers and bitumen companies.</p> <p>Removal of shampoo from tubes / bottles will be done manually. Further plastic tubes /bottles will be shredded inside the shredding machine. Plastic material and shampoo will get screened on the mesh. Color will be added to the shampoo and then finally send to the Car/floor washing solution manufacturers</p> <p>Removal of creams from tubes/bottles will be done manually. Plastic material and cream will get screened on the mesh. Color will be added to the creams and then finally send to the tyre/ vehicle polishing solution manufacturers.</p> <p>Removal of detergent from sachet/ bags will be done manually. Colour will be added to the detergent. The recycled detergent will be used as detergent to tent house bulk laundry.</p>	<p>PCBs, PAHs, Pb, As, Al, Hg, Mo, Cd, Co, Cr, Cu, Ni, Zn, Mn and Fe by TCLP/STLC (except effluent).</p> <p>ii. Fugitive emission shall be monitored for PM<sub>10</sub>, PCBs, PAHs and VOCs.</p>
5.	M/s Sunflag Iron & Steel Co. Ltd, Maharashtra.	Spent HCl generated from scrubber of glass manufacturing industry considered as hazardous waste category – A41001 Part A, Schedule III of HOWM Rules, 2016	As a resource in pickling process and Fe and Cao by ETP sludge	Spent HCl concentration is maintained for 16-18% with fresh water and stored in tank (made of FRP). Spent HCl is brought to centralized pickling plant where alloys steel bars and coils dipped inside the HCl pickling bath for 30 to 90 minutes depending upon pickling/cleaning of bars & coils. Waste pickling liquor from the spent HCl utilization process is sent to ETP for	<p>The committee recommended trial run permission may be granted with following conditions:</p> <p>i. Hazardous waste (Spent HCl) shall be analysed for Residue on ignition, Cl, SiO<sub>2</sub>, Fe, Fluoride, Mg, Ca, Na, K and COD.</p> <p>ii. Hazardous waste (ETP Sludge) shall be analysed for Acidity Content, Loss on ignition, Gross calorific value, Fe, FeO, SiO<sub>2</sub>, CaO, MgO, Al<sub>2</sub>O<sub>3</sub>, MnO, Total Flouride and Total</p>

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
				neutralization with lime. Treated effluent through filter press generates sludge and water. Sludge proposed to be used in sintering process for recovery of Fe and CaO captively. Treated water is recycled for use in washing of pickled rolled steel product.	<p>concentration of Heavy metals (Fe, Cr, Cd, Ni, Pb, As, Mn), TOC.</p> <p>iii. Product (Fe and CaO) manufactured with utilisation of Spent HCl shall be analysed for characteristics as per their IS 1405 (2010) and IS 1540 (2) (1990) respectively.</p> <p>iv. Treated water shall be analysed for pH, BOD., COD, SiO<sub>2</sub>, Heavy Metals (Fe + As + Pb + Cr + Mn +).</p> <p>v. Fugitive emission shall be monitored for HCL Mist and PM<sub>10</sub>.</p>

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