

Central Pollution Control Board
Waste Management - II Division, Delhi

Sub: Minutes of the 23rd 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) (HOWM) Rules, 2016”.

1. 23rd meeting of Technical Expert Committee (TEC) for “Evaluation of proposals received from various industries for utilization of hazardous and other wastes under Rule 9 of HOWM Rules, 2016” was organized virtually through mail in the third week of February, 2021.
2. The committee members were requested to provide their comments on 03 draft Standard Operating Procedures (SoPs), 02 proposals for revision in existing SoPs and 04 draft trial run protocols under Rule 9 of HOWM Rules, 2016, vide mails dated 19.02.2021 and 24.02.2021. List of 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 03 Draft SoPs along with the recommendations are as below:

Sl. No.	Details of the Draft SoP	TEC Recommendation
1.	SoP for utilization of ETP Sludge generated from pickling process for manufacturing of Red Oxide & Paver Block.	Upon deliberation committee observed that the dryer and ball mill should be attached with a cyclone/ bag filter with a stack of adequate height. In view of above, the committee recommended that after incorporating above suggestions, SoP shall be finalized.
2.	SoP for utilization/distillation of Dilute Acetic Acid (generated from Pharmaceutical/ Pesticide/Chemical Sector) as resource material for manufacturing of Acetic Anhydride or Glacial Acetic Acid	Upon deliberation, the committee observed that the intermediary product i.e. Ketene or Ethenone, commonly used in the manufacturing of acetic anhydride is a colorless, highly reactive and hazardous gas with a penetrating odour. It reacts violently with water. Severely irritates the eyes, the skin and the respiratory tract on release. Ketene or Ethenone is highly poisonous gas; its toxicity is about eight times that of phosgene. In case of accidental release of Ketene in the environment, it may cause havoc, if released accidentally and affect mass population in the surroundings. In view of above, the committee recommended for finalization of SoP after incorporating necessary additional preventive and safety measures to avoid hazards of ketene gas.
3.	SoP for utilization of metal and metal bearing wastes (Tin, Tungsten, Cobalt, Tantalum,	Upon deliberation, the committee recommended for SoP finalization.

Vanadium and Niobium scrap) for recovery of metal salts and alloys	
--	--

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 alkali/acidic bromide generated during manufacturing of various pesticides, pharma and organic chemicals for recovery of liquid bromine" (for incorporation of Solar Evaporator instead of MEE/AOP/RO); representation of M/s Shanro Key Chem Ind. Pvt. Ltd., Gujarat	<p>The committee examined the analysis report of final effluent and raw material i.e. bromide submitted by the unit. It was observed by the committee that the Sodium Bromide analysis indicate concentration of Sodium Bromide as 9.6%, which is too high and will certainly provide dark brown colour to effluents to be discharged for solar evaporation. Ammonia is too high and will likely to create ammonia odour in the surroundings.</p> <p>TDS, SS, Fluoride, COD & BOD are much higher than the prescribed standard for discharge of effluent into inland surface water. In case of ponding of such effluent in unlined/ improper lined lagoons for solar evaporation and there is every possibility of leachate contaminating the groundwater and soil.</p> <p>The overflow of effluents in case of heavy rains will be imminent during rainy season and the effluent released for solar evaporation cannot be keep confined.</p> <p>The committee recommended for further detailed discussion for finalization in subsequent TEC.</p>
2.	Revision of existing SoP for "Utilization of spent carbon (carbon residue) generated from urea fertilizer Industry" as per representation received from M/s Carbon India Pvt. Ltd., D-11, Industrial Growth Centre, Mansa Road, Bathinda, Punjab	<p>After detailed examination the committee observed that there is major deviation in raw material (i.e., HW) composition as well as utilization process as against the existing process of said SoP.</p> <p>In view of above the Committee recommended for trial run of the above said hazardous waste for revision in existing SoP.</p>

6. The details of the 04 draft trial run protocols along with the recommendations are given in **Annexure-B**.



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

List of Participants

Sl. No	Name	Designation and Organization	Member of the Committee / Invitee
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	SRF, WM-II Division, CPCB, Delhi	Invitee
12.	Sh. M. V. Srinivas	JRF, WM-II Division, CPCB, Delhi	Invitee



Recommendation of the Technical Expert Committee for approval of proposals under Rule 9 of the HOWM Rules, 2016.

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
1.	M/s K.G.N. Enterprises, Maharashtra	"Precious metals and alloy wastes (gold, silver, the platinum group but not mercury) in a dispersible form, non-liquid form" category – B-1150, Part B, Schedule III of HOWM Rules, 2016.	Recovery of precious metals (silver, platinum, gold, palladium and rhodium)	<p>Raw material (precious metal wastes/dust) is added with HCl then added and mixed with HNO₃ and the solution is to stand for 24 hours. Supernatant i.e. chemical water containing material products is removed and settled dust is liquid form sent to ETP. Supernatant is washed with water and allowed to settle then zinc added to it. Now this material is filtered and filtered material is dried in Pot Furnace and the filtered water is sent to ETP.</p> <p>Recovery Process:</p> <ol style="list-style-type: none"> 1. The dried material of pot furnace is mixed with aqua regia and ferrous sulphate thus silver is recovered. 2. Remaining material added aqua regia, drop wise HCl added and then washed with water. Filtered material is heated and added with ferrous sulphate, thus gold is recovered. 3. Remaining material is added with zinc and then with aqua regia and ammonium chloride, thus platinum is recovered. 4. Remaining material is added with DiMethylGlyoxime (DMG), thus palladium is recovered. 5. Remaining material is added with zinc, 	<p>The committee recommended trial run permission may be granted with following conditions:</p> <ol style="list-style-type: none"> i. Hazardous waste (i.e. Precious metal wastes/dust) shall be analysed for pH, physical form, Heavy metals (Cd + As + Pb + Cr + Cu + Ni + Zn+, Hg+) and Gold, Silver, Platinum) ii. Product: Quality and Quantity of each product recovered in different batches shall be recorded and reported along with material/mass balance of raw materials used). iii. Fugitive emission shall be monitored for PM₁₀, HCl mist, Nitric acid. iv. Source emission shall be monitored for PM, SO₂, HCl mist at APCD of Pot Furnace. v. Waste Water shall be analysed before and after treatment for pH, B.O.D., C.O.D, Cyanide, Mercury, Heavy Metals (Cd + As + Pb + Cr + Cu + Ni + Zn+, Hg+)

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
				thus rhodium is recovered.	
2.	M/s Recycle Services, Halol, Dist.: Panchmahal, Gujarat	Solid Plastic Waste having cured waste resin is listed at B3010 of Schedule VI (Hazardous and Other wastes prohibited for import) of HOWM Rules, 2016	PVC pipe waste and generated resin waste will be sold out to cement manufacturers	Activity involves only unit operations i.e., segregation, cutting and shredding of PVC pipe waste and generated resin waste will be sold out to cement manufacturers for co-processing. Manual equipment involved in the process is table cutter for different sizes and hand cutter for PVC pipe cutting. Electric shredding cum grinding machine for grinding of plastic waste	<p>Upon deliberation, committee observed that process includes physical change only. Hence, trial shall not be required however, SPCB / PCC may be permitted to grant permission for re-processing / utilization of only indigenous PVC waste with recommended conditions such as installation of bag filter as Air Pollution Control Device for extraction of dust generated during cutting and shredding. Also, the presence of Vinyl chloride vapours, which are monomer of PVC to be analyzed in work place air for safety of workers and environment.</p> <p>In view of above the committee recommended that SPCB/PCC may grant permission for re-processing/utilization of indigenous PVC waste.</p>
3.	M/s Sunraj Transporter and Contractor, Korba, C.G.	Cathode residues including silicon carbide, refractory, DIM bricks and other residues excluding SPL categorized as hazardous waste under - 11.2, Schedule I of HOWM Rules, 2016	Silicon Carbide.	Cathode residues including silicon carbide, refractory, DIM bricks and other residues procured directly from primary Aluminium Smelters is stored in a covered shed. This cathode residue is fed into crusher to achieve desirable particle size (0 to 5 mm) which is separated through magnetic separation. Dust cyclone system attached to bag filter is provided for work zone emission control.	<p>Upon deliberation committee observed that SPL contains toxic constituents like cyanide and fluoride. Analysis report of feed material does not specify whether it is the analysis report of Silicon carbon / refractory / DIM bricks / carbon portion but it may be compared with the characteristics of SPL in the already existing SoP for utilization of SPL approved by CPCB for the parameters like cyanide and fluoride.</p> <p>Silicon carbide is also a type of refractory material found in the cathode residue. Further, the process only involves grinding and bagging without mentioning removal/detoxification mechanism of fluoride and cyanide from SPL.</p> <p>In view of above, the committee recommended for trial run of cathode residue i.e., Silicon Carbide with</p>

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
					<p>following conditions:</p> <ul style="list-style-type: none"> i. Hazardous waste (i.e. Cathode residue (Silicon carbide) shall be analysed for parameters (to be decided by inspection team) prescribed in Schedule-II of HOWM Rules, 2016. ii. Product (i.e. Silicon carbide) manufactured with utilisation of hazardous waste shall be analysed for Size, Free Silicon (Si), Free Carbon, Free SiO₂, Iron Oxide Fe₂O₃, Aluminium Oxide Al₂O₃. iii. Fugitive emission shall be monitored for PM₁₀, F, CN. <p>Also joint inspection team may also carry out pilot study for other constituents of cathode residue i.e., DIM (Al₂O₃ Castable refractory), Calcium Silicate bricks, Insulating bricks (both refractory bricks and clay bricks) etc separately, (whichever applicable as per CTE).</p>
4.	M/s Passary Mineral, Sundergarh, Odisha	The SMS LD/GCP Sludge, SMS LD/GCP Classifier Sludge, Blast furnace dust and Coke oven Decanter Tar sludge of steel/ferro alloy plants is categorized as hazardous waste under the category - 35.1 of Schedule I of HOWM Rules, 2016	To manufacture LD Sludge agglomerate (to be used in blast furnace, steel making shops and sinter plant)	The SMS LD/GCP Sludge, SMS LD/GCP Classifier Sludge, Blast furnace dust and Coke oven Decanter Tar sludge collected from steel/ferro alloy plants are mixed in proportion as per the requirement and then will be pressed in to the shape of briquette. The briquettes will be placed in the chamber kiln to remove the moisture by maintaining temperature of 110° C. The kiln is fueled by producer gas. The briquettes are taken out from the chamber kiln and air cooled and, then placed in mular mixture to convert the bricks in to powder form. Also fed to ball mill, if necessary. The powder material fed to	<p>The committee recommended trial run permission may be granted with following conditions:</p> <ul style="list-style-type: none"> i. Hazardous waste (i.e. SMS LD/GCP Sludge, SMS LD/GCP Classifier Sludge, Blast furnace dust and Coke oven Decanter Tar sludge) shall be analysed for Moisture content, Carbon content, Sulphur and Heavy metals (i.e., Lead, Zinc, Tin, Cadmium, Arsenic, Mercury, Chromium, Cobalt, Nickel, Copper, Vanadium, Antimony, Manganese and iron), Total Petroleum Hydrocarbons. ii. Product (i.e. LD Sludge Agglomerate) manufactured with utilisation of Hazardous waste shall be analysed for Moisture content, Carbon content, Sulphur and

Sl. No.	Name of the Industry	HW as Raw Material	Product	Brief Process	Recommendations
				<p>nodulisation disc and fine spray of water is added to form green agglomerate. These agglomerate are again placed in chamber kiln to heat at a temperature of about 110 °C to remove moisture and further open air cooled.</p>	<p>Heavy metals (i.e., Lead, Zinc, Tin, Cadmium, Arsenic, Mercury, Chromium, Cobalt, Nickel, Copper, Vanadium, Antimony, Manganese and iron), Total Petroleum Hydrocarbons.</p> <p>iii. Fugitive emission shall be monitored for PM₁₀, CO, SO₂, NO_x, Pb and Ni.</p> <p>iv. Source emission shall be monitored for Particulate matter, SO₂, NO_x and CO.</p>
