

TREATMENT / DISPOSAL OPTIONS FOR SCHEDULE – 1 WASTES

Sr. No.	Processes		Waste Streams	Treatment disposal / options			
				Ch/ph treatment	Incineration	Landfill	Recycle
1	Petrochemical processes and pyrolytic operations	1.1	Furnace / reactor residue and debris*	*	*	1	*
		1.2	Tarry residue	*	1	*	*
		1.3	Oily sludge emulsion	*	1	*	1
		1.4	Organic residue	*	1	*	*
		1.5	Residue from alkali wash of fuels	1	*	1	*
		1.6	Still bottoms from distillation process	*	1	*	2
		1.7	Spent catalyst and molecular sieves	2	*	3	1
		1.8	Slop oil from waste water	*	1	*	1
		1.9	ETP sludge containing hazardous constituents	1	*	2	*
2	Drilling operation for oil and gas productions	2.1	Drill cuttings containing oil	1	*	2	1
		2.2	Sludge containing oil	1	1	2	*
		2.3	Drilling mud and other drilling waste*	1	*	2	*

3	Cleaning, emptying and maintenance of petroleum oil storage tanks including ships	3.1	Oil containing cargo residue and sludge	1	1	2	1
		3.2	Chemical containing cargo residue and sludge	*	1	*	1
		3.3	Sludge and filters contaminated with oil	*	1	*	1
		3.4	Ballast water containing oil from ships	1	1	*	1
4	Petroleum refining / refining of used oil/recycling of waste oil	4.1	Oily sludge / emulsion	*	1	*	1
		4.2	Spent catalyst	2	*	3	1
		4.3	Slop oil	*	1	*	1
		4.4	Organic residue from process	*	1	*	1
		4.5	Chemical sludge from waste water treatment	1	*	2	*
		4.6	Spent clay containing oil	1	2	2	*
5	Industrial operations using mineral / synthetic oil as lubricant in hydraulic system or other applications	5.1	Used / spent oil	*	*	*	1
		5.2	Wastes / residue containing oil	1	3	*	3
6	Secondary production and / or use of zinc	6.1	Sludge and filter press cake arising out of zinc sulphate production	2	*	3	1
		6.2	Zinc fines/dust/ash/skimming (dispersible form)	2	*	3	1

		6.3	Other residues from processing of zinc ash / skimming	2	*	3	1
		6.4	Flue gas dust and other particulates*	*	*	2	1
7	Primary production of zinc /lead copper and other non ferrous metals except aluminum	7.1	Flue gas dust from roasting*	2	*	3	1
		7.2	Process residue	1	*	2	*
		7.3	Arsenic-bearing sludge	1	*	2	*
		7.4	Metal bearing sludge and residue including jarosite	1	*	2	*
		7.5	Sludge from ETP and scrubbers	1	*	2	*
8	Secondary production of copper	8.1	Spent electrolytic solutions	1	*	2	*
		8.2	Sludge's and filter cakes	1	*	2	*
		8.3	Flue gas dust and other particulates*	2	*	3	1
9	Secondary production of lead	9.1	Lead slag / lead bearing residue	1	*	2	*
		9.2	Lead ash / particulate from flue gas	2	*	3	1
10	Production and / or use of cadmium and arsenic and their compounds	10.1	Residues containing cadmium and arsenic	1	*	2	*

11	Production of primary and secondary aluminum	11.1	Sludge's from gas treatment	1	*	2	*
		11.2	Cathode residue including pot lining wastes	1	*	2	*
		11.3	Tar containing wastes	*	1	2	*
		11.4	Flue gas dust and other particulates*	2	*	3	1
		11.5	Wastes from treatments of salt slag's and black drosses*	1	*	2	*
12	Metal surface treatment such as etching, staining, polishing, galvanizing, cleaning, degreasing, plating etc	12.1	Acid residue	1	*	2	*
		12.2	Alkali residue	1	*	2	*
		12.3	Spent bath / sludge containing sulphide, cyanide and toxic metals	1	*	2	*
		12.4	Sludge from bath containing organic solvents	*	1	2	*
		12.5	Phosphate sludge	1	*	2	*
		12.6	Sludge from staining bath	1	*	2	*
		12.7	Copper etching residue	1	*	2	*
		12.8	Plating metal sludge	1	*	2	*
		12.9	Chemical sludge from waste water treatment	1	*	2	*

13	Production of iron and steel including other ferrous alloys (electric rolling and finishing mills, coke oven and product plant)	13.1	Process dust*	1	*	2	*
		13.2	Sludge from acid recovery unit	1	*	2	*
		13.3	Benzol and sludge	*	1	*	*
		13.4	Decanter tank tar sludge	*	1	*	*
		13.5	Tar storage tank residue	*	1	*	*
14	Hadening of steel	14.1	Cyanide-nitrate-or nitrate-containing sludge	1	*	2	*
		14.2	Spent hardening salt	1	*	2	*
15	Production of asbestos containing materials	15.1	Asbestos containing residue	*	*	1	*
		15.2	Discarded asbestos	*	*	1	*
		15.3	Dust/particulates from exhaust gas treatment	*	*	2	1
16	Production of caustic soda and chlorine	16.1	Mercury bearing sludge	1	*	2	*
		16.2	Residue / sludge's and filter cakes's*	*	*	1	*
		16.3	Brine sludge containing mercury	1	*	2	*

17	Production of acids	17.1	Residues, dusts or filter cakes*	1	*	2	*
		17.2	Spent catalyst*	2	*	3	1
18	Production of nitrogenous and complex fertilizers	18.1	Spent catalyst*	*	*	2	1
		18.2	Spent carbon*	*	1	2	*
		18.3	Sludge / residue containing arsenic	1	*	2	*
		18.4	Chromium sludge from water cooling tower	1	*	2	*
		18.5	Chemical sludge from waste water treatment	1	*	2	*
19	Production of Phenols	19.1	Residue / sludge containing Phenol	*	1	*	*
20	Production and/or industrial use of solvents	20.1	Contaminated aromatic, aliphatic or naphthenic solvents not fit for originally intended use	*		*	*
		20.2	Spent solvents	*	1	*	1
		20.3	Distillation solvents	*	1	*	*
21	Production and/or industrial use of paints, pigments, lacquers, varnishes, plastics and inks	21.1	Wastes and residue	*	1	*	*
		21.2	Filters residues	*	1	*	*

22	Production of plastic raw material	22.1	Residues of additives used in plastic manufacture like dyestuffs, stabilizers, flame retardants etc.	1	*	2	*
		22.2	Residue of plasticizers	*	1	*	*
		22.3	Residues from vinyl chloride monomer production	*	1	*	*
		22.4	Residues from acrylonirile production	*	1	*	*
		22.5	Non-polymerised residue	*	1	*	*
23	Production and/or industrial use glues, cements, adhesive and resins	23.1	Wastes / residue (not made with vegetable or animal materials)*	*	1	*	*
24	Production of canvas and textiles	24.1	Textile chemical residue*	1	*	1	*
		24.2	Chemical sludge from waste water treatment	1	*	2	*
25	Industrial production and formulation of wood preservatives	25.1	Chemical sludge from waste water treatment	1	*	1	*
		25.2	Residues from wood alkali bath	1	*	1	*
26	Production or industrial use of synthetic dyes, dye-intermediates and pigments	26.1	Process waste sludge / residue containing acid or other toxic metals or organic complexes	1	1	2	*
		26.2	Chemical sludge from waste water treatment	1	*	2	*
		26.3	Dust from air filtration system	*	*	1	1

27	Production or industrial use of materials made with organosilicone compounds	27.1	Silicone containing residues	*	1	1	*
		27.2	Silicone oil residue	*	1	*	*
28	Production / formulation of drugs / pharmaceuticals	28.1	Residue and wastes*	1	1	2	*
		28.2	Spent catalyst / spent carbon	2	*	3	1
		28.3	Off specification products	1	*	2	*
		28.4	Date expired, discarded and off-specification drugs / medicines	1	*	2	*
		28.5	Spent mother liquor	*	1	*	*
		28.6	Spent organic solvents	*	2	*	1
29	Production, use and formulation of pesticides including stockpiles	29.1	Waste / residues containing pesticides	*	1	*	*
		29.2	Chemicals sludge from waste water treatment	*	1	2	*
		29.3	Date expired and off-specification pesticides	*	1	*	*
30	Leather tanneries	30.1	Chromium bearing residue and sludge	1	*	2	*
		30.2	Chemicals sludge from waste water treatment	1	*	2	*
31	Electronic industry	31.1	Residue and wastes*	1	1	2	*
		31.2	Spent etching chemicals and solvents	*	1	2	*

32	Pulp and paper industry	32.1	Spent chemicals	1	*	2	*
		32.2	Corrosive wastes arising from use of strong acid and bases	1	*	2	*
		32.3	Sludge containing adsorbable organic halides	*	1	*	*
33	Disposal of barrels / containers used for handling of hazardous wastes / chemicals	33.1	Chemical containing residue from decontamination and disposal	*	1	*	*
		33.2	Sludge from treatment of waste water arising out of cleaning/disposal of barrels / containers	1	1	2	*
		33.3	Discarded containers / barrels / liners used for hazardous wastes / chemicals	1	1	2	*
34	Purification process for air and water	34.1	Flue gas cleaning residue*	1	*	2	*
		34.2	Toxic metal containing residue from used ion exchange materials in water purification	1	*	2	*
		34.3	Chemical sludge from waste water treatment	1	*	2	*
		34.4	Chemical sludge, oil and grease skimming residues from common industrial effluent treatment plants (CETP's) and industry specific effluent treatment plant (ETP's)	1	1	2	*
		34.5	Chromium sludge from cooling water treatment	1	*	2	*

35	Purification process for organic compounds / solvents	35.1	Filters and filter material which have organic liquids in them e.g. mineral oil, synthetic oil and organic chlorine compounds	*	1	*	*
		35.2	Spent catalyst*	2	*	3	1
		35.3	Spent Carbon*	*	1	2	*
36	Waste treatment processes e.g. incineration, distillation, separation and concentration techniques	36.1	Sludge from wet scrubbers	*	*	1	*
		36.2	Ash from incineration of hazardous waste, flue gas cleaning residue	*	*	1	*
		36.3	Spent acid from batteries	1	*	2	*
		36.4	Distillation residue from contaminated organic solvents	*	1	*	*

- 1,2,3 indicates Order of preference for the Treatment/Disposal option.
- A number appearing twice indicates possible treatment by both options depending upon merits.
- Sign '*' Indicates Not possible to treat by this option.

TREATMENT / DISPOSAL OPTIONS FOR SCHEDULE – 2 WASTES

	<u>Class A</u>	CH. / PH TR.	INC	SLF	RCL
A1	Antimony and antimony compounds	1	*	2	*
A2	Arsenic and arsenic compounds	1	*	2	*
A3	Beryllium and beryllium compounds	1	*	2	*
A4	Cadmium and cadmium compounds	1	*	2	*
A5	Chromium (VI) compounds	1	*	2	*
A6	Mercury and mercury compounds	1	*	2	*
A7	Selenium and selenium compounds	1	*	2	*
A8	Tellurium and tellurium compounds	1	*	2	*
A9	Thallium and thallium compounds	1	*	2	*
A10	Inorganic cyanide compounds	1	*	2	*
A11	Metal carbonyls	*	1	*	*
A12	Napthalene	*	1	*	*
A13	Anthracene	*	1	*	*
A14	Phenanthrene	*	1	*	*
A15	Chrysene, Benzo (a) anthracene, fluoranthene, benzo (a) pyrene, benzo (k) fluoranthene, indeno (1,2,3-cd) pyrene and benzo (ghi) perylene	*	1	*	*
A16	Halogenated compounds of aromatic rings, e.g. polychlorinated biphenyls, polychloroterphenyls and their derivatives	*	1	*	*
A17	Halogenated aromatic compounds	*	1	*	1
A18	Benzene	*	1	*	1
A19	Organo – chlorine pesticides	*	1	*	*
A20	Organo-tin Compounds	*	1	2	*
	<u>Class B</u>				
B1	Chromium (III) compounds	1	*	2	*
B2	Cobalt compounds	2	*	3	1
B3	Copper compounds	2	*	3	1
B4	Lead and lead compounds	2	*	3	1
B5	Molybdenum compounds	2	*	3	1
B6	Nickel compounds	2	*	3	1
B7	Inorganic Tin compounds	2	*	3	1
B8	Vanadium compounds	2	*	3	1
B9	Tungsten compounds	1	*	2	*
B10	Silver compounds	2	*	3	1
B11	Halogenated aliphatic compounds	*	1	*	1
B12	Organo phosphorus compounds	*	1	*	*

B13	Organic peroxides	1	1	*	*
B14	Organic nitro-and nitroso - compounds	*	2	*	1
B15	Organic azo-and azoxy compounds	*	1	*	*
B16	Nitriles	*	1	*	*
B17	Amines	*	1	*	*
B18	(Iso-and thio-) cyanates	*	1	*	*
B19	Phenol and phenolic compounds	*	2	*	1
B20	Mercaptans	*	1	*	*
B21	Asbestos	2	*	3	1
B22	Halogen - silanes	1	*	2	*
B23	Hydrazine (s)	*	1	*	*
B24	Flourine	1	*	2	2
B25	Chlorine	1	*	2	2
B26	Bromine	1	*	2	2
B27	White and red phosphorus	*	1	*	*
B28	Ferro – silicate and alloys	?	?	?	?
B29	Manganese – silicate	?	?	?	?
B30	Halogen – containing compounds which produce acidic vapours on contact with humid air or water, e.g. silicon tetrachloride, aluminium chloride, titanium tetrachloride	1	*	2	*
	Class C				
C1	Ammonia and ammonium compounds	1	*	*	1
C2	Inorganic peroxides	1	*	2	*
C3	Barium compounds except barium sulphate	1	*	2	*
C4	Fluorine compounds	1	*	2	*
C5	Phosphate compounds except phosphates of aluminium, calcium and iron	*	*	1	2
C6	Bromates, (hypo – bromites)	1	*	2	*
C7	Chlorates, (hypo – chlorites)	1	*	2	*
C8	Aromatic compounds other than those listed under A12 to A18	1	*	2	*
C9	Organic silicone compounds	*	1	*	1
C10	Organic sulphur compounds	*	1	*	*
C11	Iodates	1	*	2	*
C12	Nitrates, nitrites	*	1	*	*
C13	Sulphides	1	*	2	*
C14	Zinc compounds	1	*	2	*
C15	Salts of per - acids	2	*	3	1
C16	Acid amides	*	1	*	*

C17	Acid anhydrides	*	1	*	*
	<u>Class D</u>				
D1	Total Sulphur	1	1	*	*
D2	Inorganic acids	1	*	2	*
D3	Metal Hydrogen sulphates	1	*	2	*
D4	Oxide and hydroxides except those of hydrogen, carbon, silicon, iron, aluminum, titanium, magnesium, calcium	1	*	2	*
D5	Total hydrocarbons other than those listed under A12 to A18	*	1	*	1
D6	Organic oxygen compounds	*	1	*	*
D7	Organic nitrogen compounds	*	1	*	*
D8	Nitrides	1	*	2	*
D9	Hydrides	1	*	2	*
	<u>Class E</u>				
E1	Flammable substances	*	1	*	*
E2	Substances which generate hazardous quantities of flammable gases on contact with water or damp air	*	1	*	*

Note : CH/PH TR : Chemical-Physical Treatment prior to further Disposal

SLF : Secure Landfill

INC : Incineration

RCL : Recycle

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