

HAZARDOUS WASTE (MANAGEMENT, HANDLING AND TRANSBOUNDARY MOVEMENT) RULES 2008 AMENDMENTS MADE THERE OF



DEFINITION OF HAZARDOUS WASTES-ITS APPLICABILITY

Waste substance is solid, semi-solid or non -aqueous liquid which because of its quantity, concentration or characteristics in terms of physical, chemical, infectious quality :

(a) Can cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitate reversible illness, or

(b) Pose a substantial present or potential hazard to humans or the Environment when it is improperly treated, stored, transported, disposed of or otherwise managed.



Any waste is hazardous if it exhibits whether alone or when in contact with other wastes or substances, any of the identified characteristics below :

(1) Corrosivity
 (2) Reactivity
 (3) Ignitability
 (4) Acute toxicity
 (5) Infectious property.



CORROSIVITY

A waste exhibits the characteristics of corrosivity if a representative sample of the waste has either of the following properties :

 (a) Any liquid which has a pH less or equal to 4 or greater than or equal to 12.5 as determined by the standard test procedure; or

 (b) A waste, which can corrode steel at a rate greater than
 6.35 mm per year at a temperature of 55 C as determined by the standard test procedure



Reactivity

- Unstable and undergoes violent change without detonation
- Violent reaction with water
- Potential explosive mixture with water
- Toxic gases, vapors or fumes generation of CN or S⁻ wastes
- Explosive
- Ignitability
 - Waste with flash point <60°C

Toxicity

- A solid waste exhibit the characteristics of toxicity if the leachate from the representative sample by TCLP test method (as followed by USEPA vide no. SW-846)



ACUTE TOXIC

Wastes generated in the manufacturing process of :

- Halogenated Phenols & other halogenated compounds
- Pesticides or pesticide derivatives
- Halogenated Benzene under alkaline conditions
- Off-specification or discarded products from the above processes



HAZARDOUS WASTES (MANAGEMENT & HANDLING AND TRANSBONDARY MOVEMENT) RULES 2008

Schedule-1

- 115 Hazardous waste streams in 36 industrial processes
- Schedule-2 (Class A to E)
 List of wastes constituents with concentration limits
- Schedule-3 (Part A & B) Part A: List of wastes applicable for Import and Export Part B: List of Hazardous characteristics
 Schedule-4 (Class A to E) List of Non-Ferrous metal wastes applicable for registration of recyclers

Responsibilities of the generator for handling of hazardous waste

- Shall be responsible for safe and environmentally sound handling of hazardous waste generated
- The Haz. Wastes generated shall be sent or sold to recycler/reuser or an authorized disposal facility
- Should give information to Haz. Waste treated and disposed of by the operator of a treatment, storage and disposal facility as determined by SPCB
 - contain contaminants and prevent accidents and limit their consequences on human beings and the environment.
- Provide persons working on the site with training, equipment and the information necessary to ensure their safety



Grant of authorization for handling hazardous wastes

- Every industry who is engaged in generation, of hazardous waste shall require to obtain an authorization
- The haz. Waste shall be collected, treated, stored or disposed of only in such facilities as may be authorized by the SPCB
- Every industry who is engaged in generation, of hazardous waste or occupier of the facility shall make an application in Form-1 to the SPCB for Authorization with in a period of sixty days from the date of commencement.



FORM-1

	FORM 1
	15 no vilan 5/31 and 1717
	The same and man (N)
	APPLICATION FOR OBTAINING AUTHORISTION FOR COLLECTION/RECEPTION/TREATMENT/TRANSPORT/STORAGE MISPSOAL OF HAZARDOUS WASTE*
	riolli, usiananananananananananananananananananan
· ,	a the second
	To .
	Pollution Control Board/
	Sir,
	1 / We hareby apply for authorisation/renewal of authorisation under sub-rule (3) of Rule 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for collection/reception/treatment/ transport/storage/disposal of hazardous wastes.
-	For Office Use Only
	5. Code No.
	6. Whether the unit is situated in a critically polluted area as identified by Ministry of
1 and the second	Environment and rotesis,
	To be filled in by Applicant
	To be filled in by Applicant Part A: General
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity :
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity ; (b) Authorisation required for (Please tick mark appropriate activity / activities ;
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity : (b) Authorisation required for (Please tick mark appropriate activity / activities : (i) collection
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity : (b) Authorisation required for (Please tick mark appropriate activity / activities : (i) collection (ii) reception
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity ; (b) Authorisation required for (Please tick mark appropriate activity / activities ; (i) collection (ii) reception (iii) treatment (iii) treatment
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity ; (b) Authorisation required for (Please tick mark appropriate activity / activities ; (f) collection (fi) reception (fii) treatment (fv) transport (v) storage
	To be filled in by Applicant Part A: General 3. (a) Name and address of the unit and location of activity ; (b) Authorisation required for (Please tick mark appropriate activity / activities ; (i) collection (ii) reception (iii) treatment (iv) transport (v) atomage (vi) alisposal
	To be filled in by Applicant Part A: General (a) Name and address of the unit and location of activity ; (b) Authorisation required for (Please tick mark appropriate activity / activities ; (i) collection (ii) reception (iii) treatment (iv) transport (v) atorage (vi) disposal (c) Is none of meaned of authorization employee uthorization author and data
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k	(a). Whethe	r the unit is generating inizateous made is defined in any initial in the second state in the second state is the second state		
	(1) 11 50 11	S Obe and diminibly or more control of		
5	(a) Total c	apital invested on the project (in Rupees)		
	(b) Year o	f commencement of production		
	(c) Wheth	er the industry works general/ 2 shifts/ round the clock		
		a to the mediate (in Tanner/KT)		
6.	(a) List at	d quantum of products and up-produces (in Tonneas KT)		
	(b) List ar	d quantum of raw material used (in Lonnearce)		
7,	Furnish a products,	flow diagram of manufacturing process showing input and outp waste generated including for captive power generation and demin	out in ter eralised	ms of water.
	2	The Theory David Wheele		
		Kurt R: Hararmons waste		
8,	Hazardou	s Wastes.	į.	
	(a)	Type of nazardous wastes generated as defined and of the	¥	
	(0)	Quantum of nazaroods waste sensered	1 (Als
	(c)	indicate wastes amenable to recycling, re-processing and reuse)		
	(6)	Mode of storage within the plant, method of disposal and car	nacity: (1	provid
	(4)	details).		
	defined	nder the Manufacture, Storage and import of the second sec		
		Part C. Heatment, Storage and Dapast and a		
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Grant of Authorization for handling hazardous wastes

- On receipt of application complete in all respects for the authorization the SPCB may, after such inquiry on being satisfied to handle haz. Waste safely, grant within a period of 120 days an authorization in form 2 to the applicant which shall be valid for a period of five years.
- Every industry authorized under these rules shall maintain a record of haz. Waste handled by him in Form 3 and prepare and submit to the SPCB, an annual return containing the details specified in Form 4 on or before the 30th day of June following to the financial year to which that return relates.
 An application for the renewal of an authorization shall be made
 - in Form 1, 60 days before its expiry to the SPCB.



FORM-3

	FORM 3 6	6.	Details of	disposal of ha	zardous	waste				3	
	[See rule 5 (6), and 22 (1)]		Date	of Concentra	tion 1	site Of	disposal	Method	of 1	ersons	in
	FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS WASTES BY THE OCCUPIER OR OPERATOR OF A FACILITY	-	disposa	constituen the final	ts in	location relevant	on the layout			lisposal	
	Name and address of the occupier or operator of a facility			form		drawing reference	for)				
	Date of issuance of authorization and its reference number :										
l	Description of hazardous waste						annes (1) - 11 - 12 - 12 - 12 - 12 - 12 - 12 -				
	Physical form with Chemical form Total volume (m ³) and weight (in kg.) description.	7.	Data on	environmental	survellla	RCE	-	1			
			Date of	Analysis of	grout	id Analy	sis of soll s	mples	Analysi	s of sir	Analys
			measu-	water Locatin Der	th Da	ta Locatia	n Depth	of Data	samples Location	Data	of an other
			FEBICIAL	nf Uf	ellez	of	samplir	18	of		sample
	A los estado de la compañía de			Sampring		Const.					details
4.	Description of storage and treatment of hazardous waste :				-						
	Date Method of storage of Date Method of treatment of hazardous wastes										
		8.	Details o	of hazardous wa	aste sold	/auctioned	to the rec	yclers ór,	reprocess	iors or ro	-users:
		9.	Details (of hazardous w	aste reus	ed or recy	cled				
			Dette	Travel	Detail	of	Motoriale	Fina	1	Not PD	Inction
	Details of transportation of bayardous waste		Date	Quantity of	hazaro	lous	received	Qua	ntity of	waste	
D.	Details of transportation of nazardous wase			Hazardous	waste	ization		Wast	c rated	genera	tion ly a
	Name and address Mode of packing Mode of Date or of the consignee of of the waste for transportation to nackase transportation site of disposal			generated	activit	<u>y</u>		8		percen	tage
					T						
					1						
			Date:	L	I		Name a	nd signa	ture of t	he Head	of facil
•			Date:		<u> </u>		Name a	nd signa	ture of t	he Head	of faci
			Date: Place:	<u> </u>	I		Name a	nd signa	ture of t	he Head	of faci

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FORM-4

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THE GAZETTE OF INDIA: EXTRAORDINARY

[PART H-SEC. 3(ii)]

<u>[91</u>

FORM 4 [See rules 5(6) and 22 (2)]

FORM FOR FILING ANNUAL RETURNS BY THE OCCUPIER OR OPERATOR OF FACILITY

[To be submitted by occupier/operator of disposal facility to State Pollution Control Board/ Pollution Control Committee by 30th June of every year for the preceding period April to March]

1	Name and address of the generator/operator of facility	44					
2	Name of the authorised person and full address with telephone and fax number	*					
3.	Description of hazardous waste	÷.	Physical form with Chemical form description				
	·						
4.	Quantity of hazardous wastes (in MTA)	4.4	Type of hazardous waste Quantity (in Tonnes /KL) (a) (b) (c) (c)				
2	Discontinutions out Strandorm		**************************************				
0.0	Description of Treatment	1.					
7.	Details of transportation	34	Name & Mode of Mode of Date of transportation consignee				
	- -	1					
8.	Details of disposal of hazardous waste		Name & Mode of Mode of Date of address of packing transportation consignee u				
	•						
9.	Quantity of useful materials sent back to the manufacturers* and others*		Name and type of Quantity in Tonnes/KL material sent back to Manufacturers Others'				

* delete whichever is not applicable # enclose list of other agencies.

 Signature : Designation :

RANK-

Storage of Hazardous waste

- The occupier , re-cyclers, re-processors, and re-users may store the hazardous waste for a period not exceeding ninety days and shall maintain a record of sale, transfer, storage, recycling and reprocessing of such wastes and keep these records available for inspection.
- Provide that the SPCB may extend the said period in the following cases namely:
- I. Small generators up to 10 tones per annum
- II. Recyclers, re-processors and facility operators up to six months of their annual capacity
- III. Generators who don't have access to any Treatment, storage, Disposal Facility in the concerned state
- IV. The wastes which needs to be specifically stored for development of a its recycling, reuse.



Packing and Labeling

- The generator shall ensure that the hazardous waste are packed based on the composition in manner suitable for safe handling, storage and transport as per guidelines issued by CPCB time to time.
- The labeling and packaging shall be easily visible and be able to withstand physical conditions and climatic factors.

Transport of Hazardous waste

• The transport of the hazardous wastes shall comply to Motor Vehicles Act. 1988 .

• The occupier shall provide the transporter with the relevant information in Form 11 (TREM CARD), regarding the hazardous nature of the wastes and measures to be taken in case of an emergency and shall mark the hazardous wastes containers as per Form 12 (Marking of Hazardous waste container).



FORM-11 (TREM CARD)

TAMILNADU WASTE MANAGEMENT LIMITED

GROUPE sustainable arowth

Truck No.

Form

TRANSPORT EMERGENCY (TREM) CARD (Use one per Waste)

1. Characteristics of waste :

Type of Waste	Physical Properties	Chemical Composition	Exposure Hazards	First Aid Requirements

1. Procedure to be followed in case of fire

2. Procedure to be followed in case of spillage / accidents / explosion :

3. For Expert Services, please contact :

(i) Name and Address :

(ii) Telephone No. :



FILLED FORM-11 (TREM CARD)

TAMILNADU WASTE MANAGEMENT LIM Form 11 Truck No. TNIS 1 3369 **TRANSPORT EMERGENCY** (TREM) CARD (Use one per Waste) 1. Characteristics of waste : Physical Chemical Exposure **First Aid Requirements** Type of Waste Hazards Composition Properties Ind case of conject nortalive T Comprehensive with eye or skin wash SEUDGE solid. magan znagelans and " with planty of water and Grow woote TOXIL endored . Seek medical adrice water tracture

1. Procedure to be followed in case of fire Extinguesh with DCP or Co2 extinguesh and inform fire service for assurptions.

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DATE:31-3-

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- 2. Procedure to be followed in case of spillage / accidents / explosion : Contran the spill with dry Sand and Joban emergency plan andaged,
- 3. For Expert Services, please contact :
 - (i) Name and Address : G. THUR
 - (ii) Telephone No. :

(Name and Signature of Waste Generator with Stamp)

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cals Ltd.



FORM-12 (MARKING OF HAZ. WASTE

FORM -12 [see rule 20(2)]							
HAZARDOUS WASTE Handle with care							
Waste category No	Compatible Group No						
Total Quantity	Date of Storage						
Contents and state of the waste :							
Sender's Name and Address:	Receiver's Name and Address: TAMILNADU WASTE MANAGEMENT LTD. Plot No. 5-15, 28-33, SIPCOT Industrial complex. Gummidipoondi - 601 201., Tiruvallur Dist. Tamilnadu.						
Phone :	Phone : 044-2792 3310						
E-mail :	E-mail : tnwml@ramky.com						
Tel. & Fax No. :	Tel. & Fax No. : 044-2668 1180						
Contact Person :	Contact Person : SAMBANDAM GT - GM (Operations)						
In case of emergency please contact :	Contact No : 99406 36300						
Manifest No. :	U.N. Classification No :						
Waste Identification :-							
STATE OF T	THE WASTE						
Aqueous	Organic liquid						
Solid	Tarry						



FILLED FORM-12 (MARKING OF HAZ. WASTE CONTAINER)

FORM -12 [see rule 20(2)]

HAZARDOUS WASTE



Handle with care

Waste category No	Compatible Group No
Total Quantity	Date of Storage
Contents and state of the waste: Sleedge forom he	ste water tretment
Sender's Name and Address:	Receiver's Name and Address: TAMILNADU WASTE MANAGEMENT LTD. Plot No. 5-15, 28-33, SIPCOT Industrial complex. Gummidipoondi - 601 201., Tiruvallur Dist. Tamilnadu.
Phone: 04344253509	Phone : 044-2792 3310
E-mail :	E-mail : tnwml@ramky.com
Tel. & Fax No. :	Tel. & Fax No. : 044-2668 1180
Contact Person: Thisrconcercegon	Contact Person : SAMBANDAM GT - GM (Operations)
In case of emergency please contact : 04344253509	Contact No : 99406 36300
Manifest No.: 15551	U.N. Classification No :
Waste Identification :- Sleedge from hloste	Water tretment
STATE OF T	THE WASTE
Aqueous	Organic liquid
Solid 🗸	Tarry



Manifest System (HW Movement Document)

The occupier shall prepare six copies of manifest in Form-13 (Color coded)





FORM-13 (MANIFEST DOCUMENT)

FORM - 13 [See Rule 21(1)] HAZARDOUS WASTE MANIFEST (Information of Hazardous Waste For Disposal)

1 Generator's / Occupior's Nomo & Mailing Address :		5. Occup er's Registration No				
Tel No	3. Manifest Documents No. 11470					
TNWM Membership No. :						
 Lransporter s Name & Address ; 	5. Type Of Vehicle : Truck T Terker D Special Vehicle					
	6. Transporter's A	uthorization No.				
Contest No.		7. Vehicle Regis	tration No. :			
8. Designated Facility Name & Site Ad	Idress:	9. TSDF Author	zation No 5086	3 DL 19.10.07		
Tamil Nadu Waste Management L Plot No. 5-16 28-33, EPIP Building, SIPCUL Insustrial Camples, Gummidiscond	10. TSDF Phone	+ No. 044 - 2792	3310			
1 Waste Description		12. Total Quantil	y of Waste			
		m ³	1	Tons		
		13. Consistency				
		Semi So	lid : Ta			
	itable Tosio	Sludge :	Sh	ITTY -		
	15 Containers					
*4.Transport Description of Weste	No. Type	- 16. Total Quantity	12. Unit Weight Wit/ Vol	na. Waste Category N		
				Schedule 1		
				Schedule 2		
19.Special Handling Instruction & Add	itional information	:				
20. Generator's/Occupier's Contificate a accurately described shove proper sh the respects in proper conditions for t	I hereby declare t ipping name and i ransport by road a	he: the contents o are categorized, p ccording to appica	f the consignme acked, marked ble national gov	nt are fully and and lateled and are vernment regulations.		
		Morth	Day	Year		
Occupier's Name & Stamp	Signature					
21 Transporte "s Acknowledgement of	Receipt of Meteria	als		and the second sec		
		Month	Day	Vear		
Transporter's Name & Stamp	Signature					
22.D schepancy Note Space :				and the second second		
23. Foolity Dwne / Spenston's Certific	alion of Receipt of	Haza dous Waste	the second s	THE REAL PROPERTY OF		
		Month	Day	Year		
Operator's Name & Stamp	Signature					
NOTE : Please allach Comprehensive	Analysis Report P	hotocopy.		COPY 3 Of		
Pink Copy		То	be retained by	the operator of a facili		

FILLED FORM-13 (MANIFEST DOCUMENT)

	[See Rule	21(1)]			
HAZAR	DOUS WAS	STE MANIFEST			
(Information	of Hazardou	s Waste For Dispe	osal)		
and the state of t	Address :	2. Occupier's Regi	stration No.		
ieneral	Gail	126 1-	7 «	TEET	
		3. Manifest Docum	ients No.	10001	
		5. Type Of Vehicle :	Truck Tar	nker 🗆 Specia	al Vehicle
Transporter's Name & Address .		6. Transporter's Aut	thorization No. :		
TRUCAT				and an and a second	
		7 Vehicle Registr	ation No. :	NIE 5 3	3369
ntact No.		9. TSDF Authoriza	ation No. : 3086	Dt 19.10.07	
Designated Facility Name & Site Addres	ted.	10. TSDF Phone	No. 044 - 27923	310	
nil Nadu Waste Management Entry	1201			Children of Children of Children	
PCOT Industrial Complex, Gummidipoondi - 00	1201.	12. Total Quantity	of Waste		
.Waste Description :	-	m ^{3.}	:	de 7 As	Gions :
SLUDGE FROM What	TC	13. Consistency			
WATER TREATER.		Solid :		TV :	
				irry :	
Corrosive Reactive Ignita	ble D Toxic	Siudge .			
	15. Containers :	16. Total Quantity	17. Unit Weight	18. Waste C as per	ategory No.
4.Transport Description of Waste	No. Type				2
	1	27450	ing	Schedule I	29
ETP SLUDGE	and the second s		And I have been a start of the	Schedule 2	3
		and the second sec		LE MAN	DL ING
19. Special Handling Instruction & Addition	onal informatio				
	hereby declar	e that the contents	of the consignme	ent are fully a	nd and are in
20. Generator's/Occupier's Certificate .			nacked marked	, and labeled	
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அகம் தாய்மை வாய்மைக்கு! புறம் தாயமை வாழவுக்கு,



CRITERIA FOR ACCEPTANCE OF HAZARDOUS WASTES TO TSDF SITE Generators should provide information on Through inputs and process that generates the waste with quantities Physical and chemical Characteristics of waste Analytical procedures and interpretation of results Hazardous waste codes as per schedule 1 & 2

IWMA Membership
TNWML Agreement Finalization
Waste Characterization / CA generation
TNPCB Authorization
Essential For Transportation
Following the regulations / Carrying Documents

Flow Pathway of wastes





Comprehensive Analysis

Physical	Physical state, Color and Texture, Flash point, LOD at 105°C, LOI at 550°C, Calorific Value, Paint filter liquid test, Liquid release test
Chemical	pH, reactive cyanide, reactive sulphide, Sulphur (elemental) Concentration of Inorganics as per schedule-2
Others	Extractable organic fraction, C,H,N,S
	Individual Organics as per schedule-2
	TCLP characteristics (Organics & Inorganics)



Finger Print Analysis

 Finger print analysis shall be performed by operator at TSDF:

Physical state Colour and Texture

pН

Loss on Drying at 105°C

Loss on Ignition at 550°C

Flash point

Calorific value

Paint filter liquid test

Reactive Sulphide

Reactive Cyanide

Chemical compatibility

Other parameters on merit



CRITERIA FOR ACCEPTANCE OF HAZARDOUS WASTES FOR DIRECT DISPOSAL TO SECURED LANDFILL

(as per CPCB – MoEF Guidelines)

Leachate Quality *	Concentration	Water soluble compound	s < 10%	
рН	4 to 12	except salts		
Total Phenols	< 100 mg/l	Calorific value	<2500K.Cal/Kg	
Arsenic	< 1 mg/l	Strength		
Lead	< 2 mg/l	Transversal strength	> 25 KN/m ²	
Cadmium	< 0.2 mg/l	(Vane Testing)		
Chromium-VI	< 0.5 mg/l	Unconfined Compression test	> 50 KN/m ²	
Copper	< 10 mg/l	Axial Deformation	> 20%	
Nickel	< 3 mg/l			
Mercury	< 0.1 mg/l	 Degree of Mineralization or Content of Organic Materials (Original Sample) 		
Zinc	< 10 mg/l	Annealing loss of the dry	<20%byweight	
Fluoride	< 50 mg/l	residue at 550°C (for non-	
Ammonia	< 1,000 mg/l	t de la constante de la consta	<5%bvweiaht	
Cyanide	< 2 mg/l	(for biodegradable	
Nitrate	< 30 mg/l	v	vaste)	
Adsorbable organic bound Chlorine	< 3 mg/l	Extractible Lipophilic contents (Oil & Grease)	<4%byweight	

* Leachate quality is based on Water Leach Test



WASTE DISPOSAL OPTIONS

Waste at TSDF could be handled in different ways

- Direct disposal in to landfill
- Treatment/stabilization of waste and then disposal into landfill
- Direct incineration
- Pre- treatment and Incineration

Pre- treatment, incineration and disposal of ash in to landfill

> Others

Disposal Pathways

RAMK



THE INGREDIENTS FOR STABILIZATION



INGREDIENTS FOR STABILISATION

Sodium Silicate

Bentonite

Fly Ash

Alkaline chlorination for cyanides

Sodium sulphide for Mercury bearing wastes

WASTE TREATMENT/ STABILISATION

Treatment/ Stabilization operations are carried out for all wastes identified for the purpose so as to minimize their contaminant leaching potential. Stabilisation could involve – immobilization of leachable material by Fixation as non-reactive solids

Reduction of volume

Reducing contaminant level of org/inorg

WASTE TREATMENT/STABILISATION

> Immobilization/Chemical fixation

chemical binding of contaminants within a cementing structure to reduce the mobility of leachability of the waste constituents

Encapsulation

Entrapment of contaminant particles within a solid matrix

Solidification

The conversion of slurries that do not readily dewater into solids by addition of solidification and adsorption agents



LIABILITY OF OCCUPIER, TRANSPORTER AND OPERATOR OF A FACILITY

The occupier, transporter and operator of a facility shall be liable for all damages caused to the environment or third party due to improper handling of the hazardous waste or disposal of the hazardous waste.

Shall be liable to pay financial penalties as levied for any violation of the provisions under these rules by TNPCB with the prior approval of the CPCB.



THANK YOU