

Gujarat Pollution Control Board

Guideline for the management of the spent solvents

MANAGEMENT OF SPENT SOLVENTS

Using 4R - Reduce, Reuse, Recover, Recycle

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1. Aim of the guideline :

The aim of this guideline is environmentally sound management of spent solvents generating from the industrial manufacturing activities and for the control of Volatile Organic Carbon (VOC) concentration in ambient air and also to put check on unauthorized disposal of spent solvents and residues / wastes generating from the distillation process thereof.

2. Need of the guideline:

Gujarat is a hub of the chemical industries. It also houses the pesticide and bulk drug manufacturing units in large numbers. The use of the solvents (organic solvents) in such type of industries is very high and so generation of huge quantum of spent solvent from these industries is evident.

In recent past, as the quality standards for the use of solvents have been made more stringent under GMP and due to international quality standards requirement, the recycle / reuse of the spent solvent for the certain processes are now restricted. This has demanded the alternate routes for management of spent solvent.

In addition, incidents of unauthorized disposal of the solvent through marginal industries in to environment were observed by the Board, necessitated to frame a guideline in this regard.

Also, there has been demand for the streamlining and standardization of the processes on the subject from the industries, there is a need to frame a specific guideline for the management of the solvents.

3. Principles and basis of guideline:

Extended Producers Responsibility (EPR) is the guiding principle and base of this guideline. According to this principle, the generator of the spent solvent is responsible for environmentally sound management and disposal of the spent solvent. It is known that spent solvent is hazardous waste as per Hazardous Wastes (Management Handling and Transboundary Movement) Rules-2008.

“Cradle to Grave” philosophy has also been integrated to ensure that disposal of all the wastes generating during the life cycle is done in environmentally sound manner.

Considering the above, it is emphasized that **“No spent solvent shall be sold /given to unauthorized person / company and defined procedures shall be followed in management and disposal of the spent solvents”**.

4. Stakeholders and concerned areas:

- A. Broadly, the concerned stakeholders can be divided in to the following groups:
- i. Generator of the spent solvent
 - ii. Distillation carrying out unit (Both onsite and offsite distillation unit)
 - iii. Actual user of the recovered solvent
 - iv. Transporter of spent solvent
- B. This guideline touches upon various activities pertaining to:
- i. Roles and responsibility of stakeholders
 - ii. Record keeping for the solvent management and disposal (For all the stakeholders)
 - iii. Technical aspects to be taken care during distillation of spent solvents by both onsite and offsite distillation units.
 - iv. Inter relationship of the stakeholder and collective responsibility.
 - v. Disposal and management of hazardous wastes generating from distillation.

5. Time frame and jurisdiction:

This guideline will be implemented initially for a trial period of (12) Twelve months and thereafter it will be reviewed for its amendments and implementation. It will be applicable to all the concerned industrial units of the Gujarat.

6. Scope of the guideline :

This guideline applies to:

- A. Industries using and / or generating Spent Solvents / Recovered Solvents
 - i. Having their complete / partial in house- onsite distillation facility
 - ii. Out sourcing its spent solvent for the distillation process.
- B. Offsite distillation units engaged in distillation of spent solvents.
 - i. Carrying out distillation of the generating units purely on job-work basis (It is also known as toll recycling in which the recovered solvent and /or distillation residue is given back to the parent industrial unit)
 - ii. Independent off site distillation unit. (Distillation unit manages recovered solvent and /or distillation residue)
- C. Actual users - Industries using spent solvents/ Recovered solvents are other than generating units.

7. Roles and responsibilities:

7.1 Spent Solvent generating unit :

- i. All the units generating spent solvent shall maintain the records of management and disposal of the all the solvents in the prescribed format as per Annexure- I attached herewith and shall produce to the Gujarat Pollution Control Board (Board) / Authority as and when demanded.
- ii. All spent solvent generating units shall ensure that management of spent solvent follows concept of 4R and are treated for its maximum use through

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- distillation and other processes. Only non-recoverable and non usable solvents shall be disposed through its co-processing and /or incineration.
- iii. It is desired that the spent solvent generating unit carries out in-house distillation of its spent solvents to the maximum extent for the minimal handling of the spent solvent and risks associated with offsite distillation processes.
 - iv. In case of requirement of off-site distillation, then distillation must be done through pre-fixed off-site solvent distillation units. A comprehensive agreement with precise terms and conditions shall be made by generator with such off site distillation units and shall have valid permission for the same of the Board. (Names of off-site distillation units must be mentioned in CCA).
 - v. If the spent solvent generating unit gives its spent solvent to offsite unit for toll recycling or otherwise, it shall carry out its periodical audit of the distillation unit for its solvent quantum and ensure that distillation is carried out in environmentally sound manner. Generating unit should do it through physical random inspection / checking and inspection of records thereof. Necessary clauses /conditions for this shall be embedded in to the agreement /contract made as per condition (iv) above.
 - vi. Off site distillation facility (unit) shall be in the proximity of the generating unit preferably in the same industrial estate / cluster.
 - vii. Conveyance of spent / recovered solvent shall be carried out through authorized vehicles only following the guideline prescribed in Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008. Such vehicles shall be GPS enabled.
 - viii. The generating unit shall submit a notarized undertaking as per the format given in Annexure "A".
 - ix. Manifest system for the movement of the hazardous wastes under Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 shall be followed for the spent solvent also.
 - x. Off-site distillation, outside of Gujarat will not be permitted in any case. However, for sale of recovered solvents outside Gujarat Hazardous Wastes

(Management, Handling & Transboundary Movement) Rules, 2008 shall be strictly followed. Transportation shall be done only through authorized vehicle enabled with GPS.

7.2 On site and Off site Distillation units:

A. Technical aspects for distillation :

- i. Solvent recovery shall not be less than 95% under any case and shall be upgraded gradually to achieve 99% recovery.
- ii. Distillation of spent solvents should be done by vacuum distillation and facility shall include close circuit dry vacuum pump, minimum two condensers with second condenser using chilled water / brine solution as cooling media.
- iii. The condensers shall be provided with sufficient Heat Transfer Area and residence time so as to achieve more than 95% recovery and upgrade it to 99%.
- iv. Solvents shall be stored in a separate space specified with all safety measures. It shall be transferred through solvent transfer pump.
- v. During loading and unloading of spent solvent / distilled solvent from tanker to storage tank or storage tank to tanker, vent of both (i.e. storage tank /tanker) shall be connected to each other so as to minimize VOC emission.
- vi. The solvent storage tanks shall be provided with breather valve to prevent losses. Vent of all storage tanks (for spent solvent /Distilled solvent) shall be connected through condenser.
- vii. Normally spent solvents shall be stored in dedicated tanks. In case of storage of spent solvent in drum is required, it shall be done in leak proof drums in good condition with tightly closed lids / caps and stored in close shed having adequate safety measures. Nomenclature and proper label pasted on them indicating name of solvent, date of generation, batch no, quantity etc. shall be made on each of the storage unit.

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- viii. Vents of reaction vessels, centrifuges, condensers etc, which are the potential sources of the VOC, shall be connected to proper air pollution control measures like activated charcoal tower.
- ix. The vent of the condenser shall be 6m above the roof top.
- x. Reactor and solvent handling pump shall have proper seals to prevent leakages.
- xi. Entire Plant shall be flame proof. Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. All storage tanks and vehicles shall be fitted with spark arrestors.
- xii. For drying of solid products containing solvents, tray dryers or fluidized bed dryer with vents open to atmosphere should not be used. Instead dryers (like RVCD, VTD, Vacuum agitated nutch filters etc) with facility of solvents recovery from exhaust air shall be used. If required, vent / stack after solvent recovery, shall be connected to activated charcoal tower for the prevention of the VOC.
- xiii. Every Distillation facility shall have VOC monitoring facility. VOC monitoring shall be regulatory carried out and its record shall be maintained.
- xiv. All efforts shall be carried out to control the odour nuisance from the processes.
- xv. The unit shall comply with work zone standards as per The Factories Act and Gujarat Factories Rules.

B. Management aspects for Distillation unit (Both off site and onsite):

- i. The distillation unit shall maintain the records of receipt, management and disposal of the all the solvents in the prescribed format as per Annexure- II attached herewith and shall produce to the Gujarat Pollution Control Board (Board) / Authority as and when demanded.
- ii. In case of off-site toll distillation, entire quantity of distillation residue, condensate etc. shall be collected / lifted back by generating unit from the outsourced distillation unit to which solvents were given for distillation. In the case of the independent off site distillation unit, the distillation residue shall be disposed through co-processing / incineration.

- iii. Recovered solvent shall be either used in-house or sold to the actual user. Only the recovered solvents not suitable for reuse (in-house or by actual user) shall be disposed off through co-processing or else shall be incinerated following the requirement of the prevailing Acts and Rules.
- iv. As per hazardous waste rule 2008, spent solvents (before distillation) and Recovered solvents along with other hazardous wastes generating from the process shall not be stored for more than 90 days. The time may be extended with prior permission of the Board as per provisions of the Hazardous wastes (Management, Handling & Transboundary Movement) Rules, 2008.
- v. Selling of the spent solvent, recovered solvent to the traders is not permitted but such sale shall be executed directly to the authorized actual users / units.

C Specific Conditions to be followed by Offsite Distillation Unit:

- i. Off-site distillation units shall not have any drainage connection (other than for disposal of sewage). An undertaking by owner of unit in this regard shall be submitted to Board. If the unit is located in any of the GIDC, a certificate from GIDC authorities shall be furnished to the Board. Offsite Distillation unit shall strictly observe zero liquid discharge (ZLD) status.
- ii. Offsite Distillation unit shall obtain the permission of the Central Pollution Control Board under rule 11 of the Hazardous Wastes (MH & TM) Rules-2008.
- iii. The distillation unit shall submit a notarized undertaking as per the format given in Annexure B.

7.3 Actual user of spent / Recovered Solvent (other than generator and / off site distillation unit:

- i. The unit shall be actual and genuine user of the recovered solvent.
- ii. The unit shall maintain the record of the receipt and use of the recovered solvent in the prescribed format as per Annexure- I attached herewith and

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shall produce to the Gujarat Pollution Control Board (Board) / Authority as and when demanded.

- iii. Transportation of recovered / spent solvent shall be done through authorized vehicles only following the guideline prescribed in Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008. Such vehicles shall be GPS enabled.

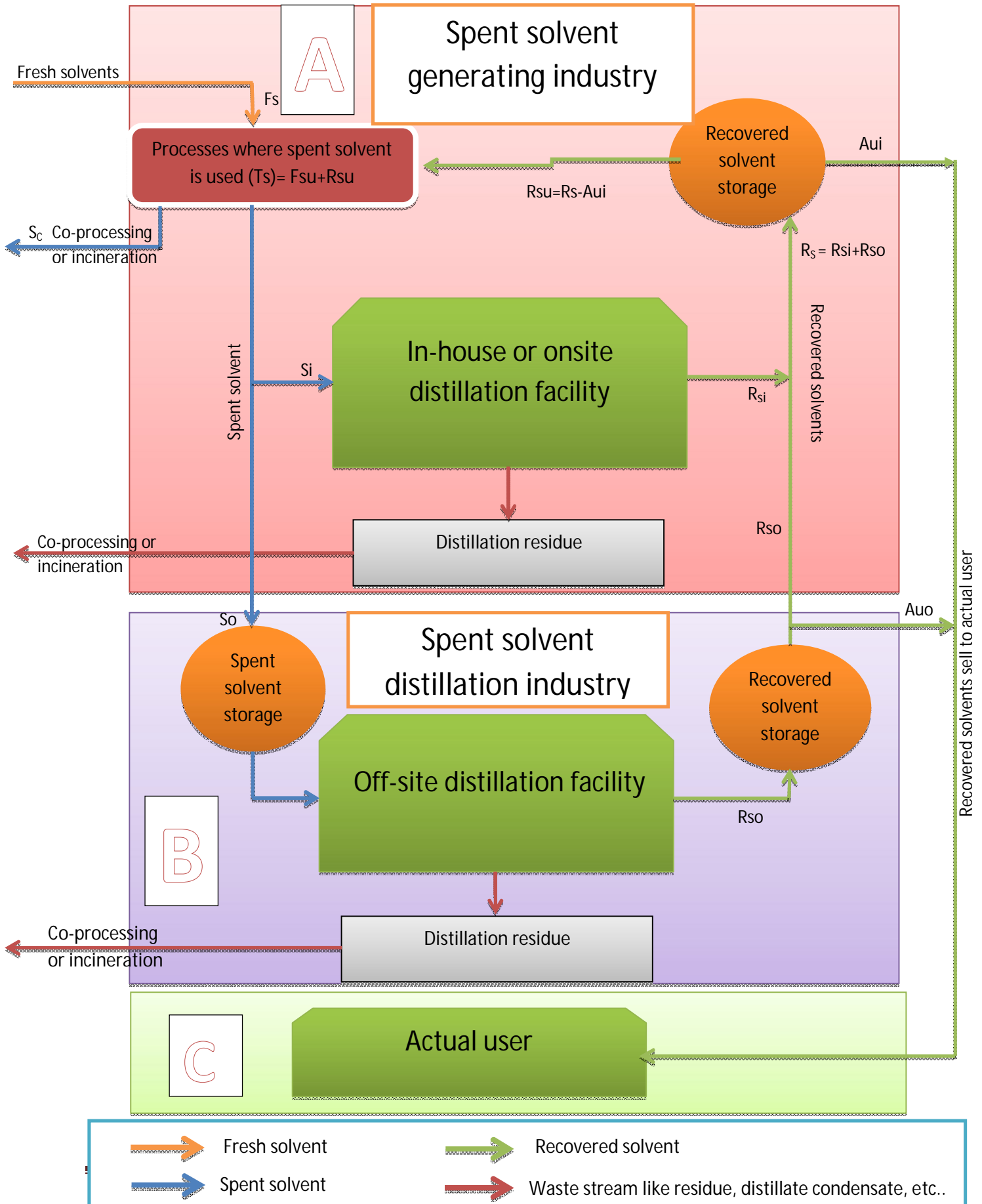
8. Authority :

This guideline is issued by Gujarat Pollution Control Board pursuant to the decision taken in Board meeting dtd.10/03/2016. The Chairman, Gujarat Pollution Control Board shall be final authority to decide for any matters pursuant to this guideline.

9. Attachment:

- Annexure "A" - Format of Notarized Undertaking to be submitted by Generating Units.
- Annexure "B" - Format of Notarized Undertaking to be submitted by Distillation Units.
- Annexure "I" - Format for monthly returns to be submitted by the Generating units- Table A1, A2, A3 & A4
- Annexure "II" - Format for monthly returns to be submitted by the distillation units

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Annexure "A"

To be submitted by spent solvent generating industry (Generator)

UNDERTAKING

I, Mr. _____, Occupier of M/s. _____ located at _____, do here by solemnly undertake as under:

- i. Our / My industry is engaged with manufacturing of _____ with CCA of the Board valid up to _____.
- ii. Whereas solvent is used in our industry /activity and Spent solvent guideline prepared by the Board is applicable to our /my industry.
- iii. I / We undertake that I /We will follow the guideline prepared by the Board for the management of the spent solvent in letter and spirit.
- iv. I / We undertake that I / We will maintain the records of the solvent as prescribed in the guideline for the spent solvent by the Board.
- v. I / We will sell recovered solvent only to the actual user industry.
- vi. I / We undertake that We / I will upgrade our solvent distillation unit in 90 days to meet with all the requirements as per the guideline prepared by the Board/our distillation unit is fully equipped with all the requirements. (In case of onsite distillation facility).
- vii. I / We will carry out audit of the offsite distillation unit, in case spent solvent is given outside our premises.
- viii. I / we as occupier / Generator / Facility operator will strictly adhere & comply with the hazardous waste (Management, Handling & Transboundary Movement) Rules – 2008.

What is stated above is true to best of my knowledge.

Date :

Name :

Place:

Designation:

Annexure "B"

To be submitted by Offsite distillation unit (Receptor)

UNDERTAKING

I, Mr. _____, Occupier of
M/s. _____ located at _____, do here by solemnly
undertake as under:

- i. Our / My industry is engaged with manufacturing of _____ with CCA of the Board valid up to _____.
- ii. Whereas distillation of spent solvent is being carried out in our industry and Spent solvent guideline prepared by the Board is applicable to our /my industry.
- iii. I / We undertake that I /We will follow the guideline prepared by the Board for the management of the spent solvent in letter and spirit.
- iv. I / We undertake that I / We will maintain the records of the solvent as prescribed in the guideline of the Board.
- v. I / We undertake that We / I will upgrade our solvent distillation unit in 90 days to meet with all the requirements as per the guideline prepared by the Board/our distillation unit is fully equipped with all the requirements. (In case of onsite distillation facility).
- vi. We will make an agreement with the spent solvent generating unit from whom we purchase the spent solvent and it will be binding to us that spent solvent generating industry carry out audit of our distillation unit from time to time.
- vii. We will sell recovered solvent to only actual user industry.
- viii. I / we as occupier / Generator / Facility operator will strictly adhere & comply with the hazardous waste (Management, Handling & Transboundary Movement) Rules – 2008.

What is stated above is true to best of my knowledge.

Date :

Name :

Place:

Designation:

Annexure-I: Table A1 : Solvent Utilization

Sr. No.	Name of solvents	Opening stock of solvents (Kg)			Solvent used in process (Kg)			Spent solvent generated (Kg) (S)	solvent loss (Kg)	Closing stock of solvents (Kg)		
		Fresh	Recycled	Total	Fresh solvent (F)	Recycled solvent (R)	Total			Fresh	Recycled	Total
1												
2												
3												
4												
5												

Annexure-I: Table A2 : Spent Solvent Management

Sr. No.	Name of spent solvents	Opening stock of Spent solvent (Kg) (S)	Declaration of non recoverable or not intend to recover spent solvent (SC)			Balance Quantity (Kg)	Distillation of spent solvent carried out			Closing stock of Spent solvent (Kg)
			Quantity (KG)	mode of disposal	Name/Place of disposal		on-site quantity (Kg)(SI)	off-site quantity (Kg) (SO)	off-site facility name	
1										
2										
3										
4										
5										

Annexure-I: Table A3 : Recovered Solvent Management

Sr. No.	Name of solvents	Opening stock of Recovered solvents (Kg)			Waste generation at on-site distillation facility		Waste generation at off-site distillation facility		Recovered solvents used in process (KG) (R)	Recovered solvents sell to actual user including co-processing (AI)		Closing stock of Recovered solvents (Kg)
		On-site (RI)	Off-site (ROI)	Total	Distillation residue (Kg)	condensate from distillation (Kg)	Distillation residue (Kg)	condensate from distillation (Kg)		Quantity (Kg)	Name of actual user	
1												
2												
3												
4												
5												

Annexure-I: Table A4 : Overall solvent Inventory

Sr. No.	Name of solvents	Total opening solvent stock (Kg) (F+R)	Total solvent consumed (Kg) (F+R)	Total spent solvent generated (Kg) (S)	Spent solvent disposal other than distillation quantity (Kg)	Total spent solvent sent for distillation (Kg) (I+O)	Total solvent recovered (Kg) (RO+RI) (I+O)	Total Recovered solvent sell to actual user including co-processing (Kg)	Total spent solvent used in co-processing (Kg)	Closing stock of spent solvents (Kg)	Closing stock of recovered solvents (Kg)
1											
2											
3											
4											
5											

Annexure II : Format for monthly returns to be submitted by the off-site distillation units

Sr. No.	Name of solvent	Spent solvent received for distillation				Recovered solvents (kg)	Recovered Solvents sell to actual users		Material sent to generating unit			Storage of Recovered solvents at its facility (Kg)
		Name of generating unit	Quantity (kg)	Purity (%)	Net quantity (Kg)		Quantity (Kg)	Name of actual user	Recovered solvent (Kg)	Distillation residue (Kg)	condensate from distillation (Kg)	
1												
2												
3												
4												
5												