



**PROTECTING FUTURE
PREFERRED WASTE MANAGERS**

PRE- PROCESSING FACILITY – EXPERIENCES

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Co-processing

Is

Utilization of Wastes Materials

in

Cement Production

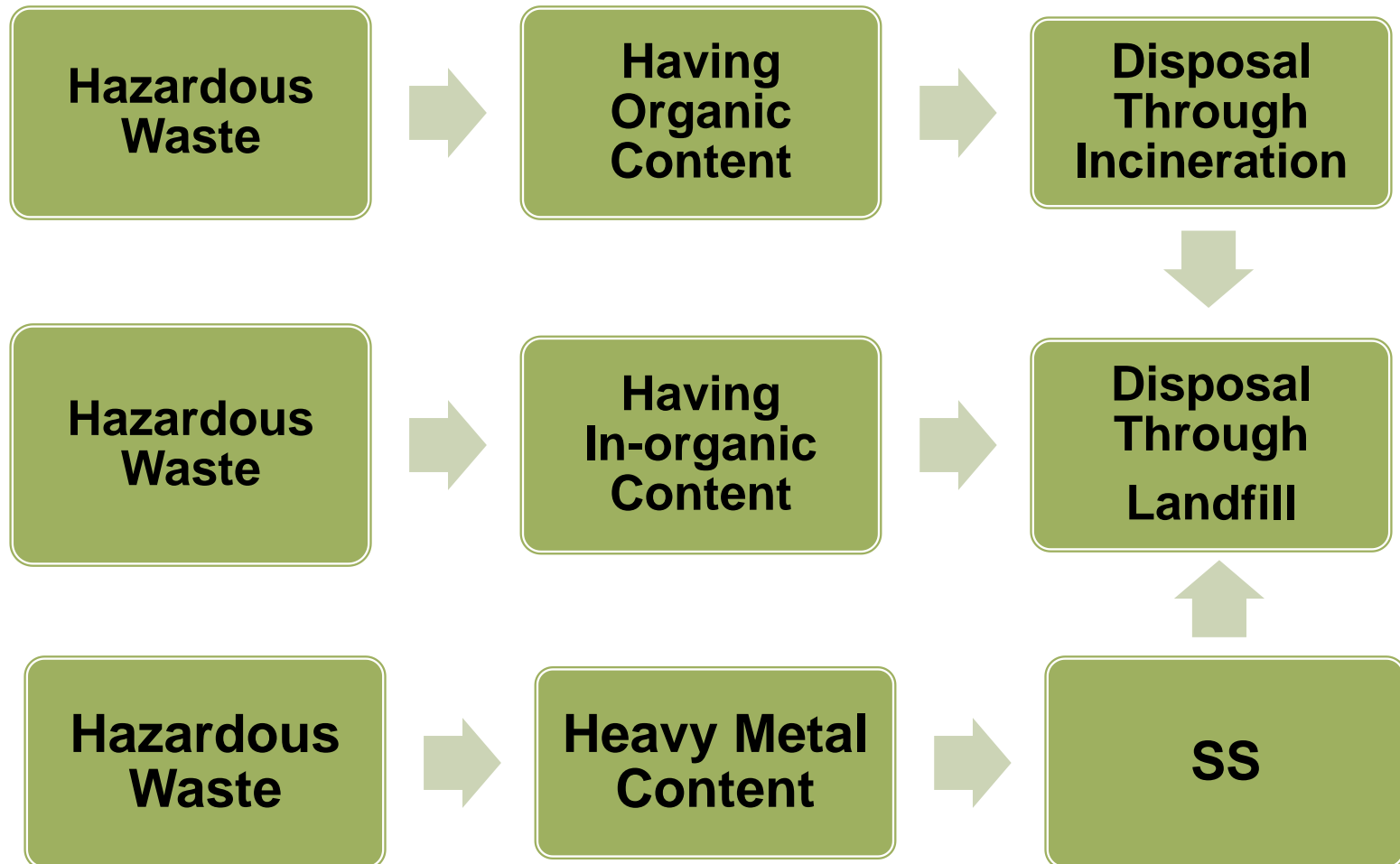
CO-PROCESSING OF WASTES

- **Industrial wastes**
 - **Hazardous wastes**
 - **Organic – as Fuels**
 - **Inorganic – as raw materials**
 - **Non Hazardous wastes**
- **Non Industrial Wastes**
 - **Domestic**
 - **Commercial**
 - **Agro based**

LEGAL NEED IS SAFE MANAGEMENT OF HAZARDOUS WASTE

- **Recycling / Sale for Reuse**
- **Treatment & Disposal**

HAZARDOUS WASTE MANAGEMENT



HAZARDOUS WASTE MANAGEMENT

Sr. No	Hazardous Waste	Available QTY	Potential Environmental Threat
1	Organic Incinerable Waste	20%	80%
2	Inorganic Landfillable waste	80%	20%

ISSUES RELATED TO INCINERABLE HAZARDOUS WASTE

- Most Toxic
- Large Generation
- Inadequate Treatment and Disposal Infrastructure
- High Cost of Incineration
- High Impact on Environment

CO-PROCESSING BENEFITS

“Recycling/Reuse/Utilization”

is

Environmentally/ Economically better than

“Treatment and Disposal”

CO-PROCESSING BENEFITS

- Avoid Land Disposal
- Avoid Investment on Developing Landfill
- Avoid Long term liability on wastes and associated problems
- No Waste is generated that requires subsequent processing
- Favorable process conditions in cement kiln ensure complete
 - Destruction and absorption of gases , Uniform temperature range > 1400oC
 - Residence time > 6 secs, Alkaline conditions facilitate neutralization
- Conversion of waste into energy/Alternate Fuel

DIRECT CO-PROCESSING v/s PREPROCESSING - CO-PROCESSING

- Direct Co-processing is utilization of waste as it is; in its original form.
- Conversion of waste in useful form and then its utilization.

DIRECT CO-PROCESSING LIMITATION

- Large number of wastes are directly not suitable due to its physical and chemical characteristics limitation.
- Large variation in physical and chemical characteristics of waste leading to;
 - Difficulties in unloading
 - Difficulties in Storage
 - Difficulties in Feeding
 - Process Disturbance
 - Product Quality Disturbance
 - Emission Disturbance
 - Legal Compliance
 - Safety Issues

DIRECT CO-PROCESSING LIMITATION

- Need High Investment
- No Consistency in customer service
- Storage issues at Generator side
- Safety Issues at Generator Side
- Legal Non Compliance
- Non Tracking of Waste movement
- Reliability on Transport agency
- Indiscretion disposal
- Environmental Hazards

**Pre-processing Facility (PPF) is a
“Preparatory” or Pretreatment Unit”**

**For Final Treatment called
“ Co-Processing”**

BENEFITS OF PRE-PROCESSING FACILITY

- Most wastes are not suitable for direct utilization in cement kiln.
- Cement plants need consistent supply of uniform quality of “Wastes Materials” as fuel.
- Ensures consistency waste quality, consistence emission, uniform operation.
- Technical and Safety considerations.
- Procedural matters.

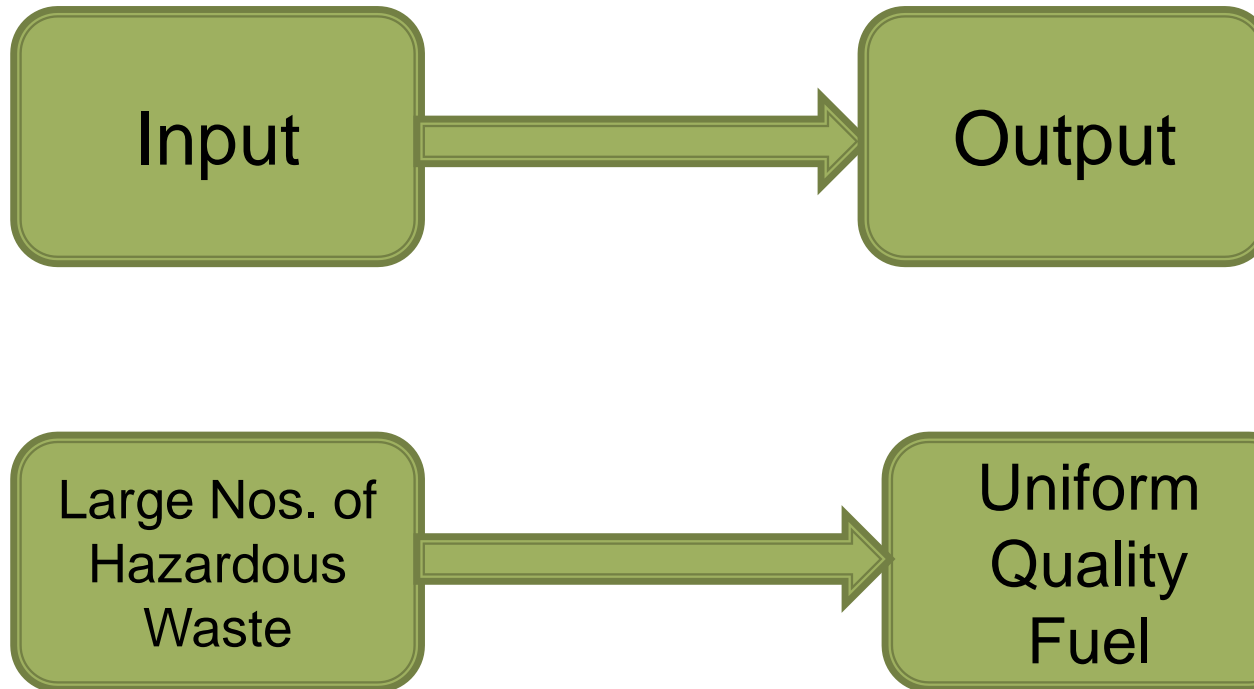
PRE-PROCESSING

Bridge between Wastes Generators and
Cement company



AFRF: Alternate Fuel and Resource Facility

AFRF/ PRE-PROCESSING : GENESIS



PRE-PROCESSING FACILITY- WHY??

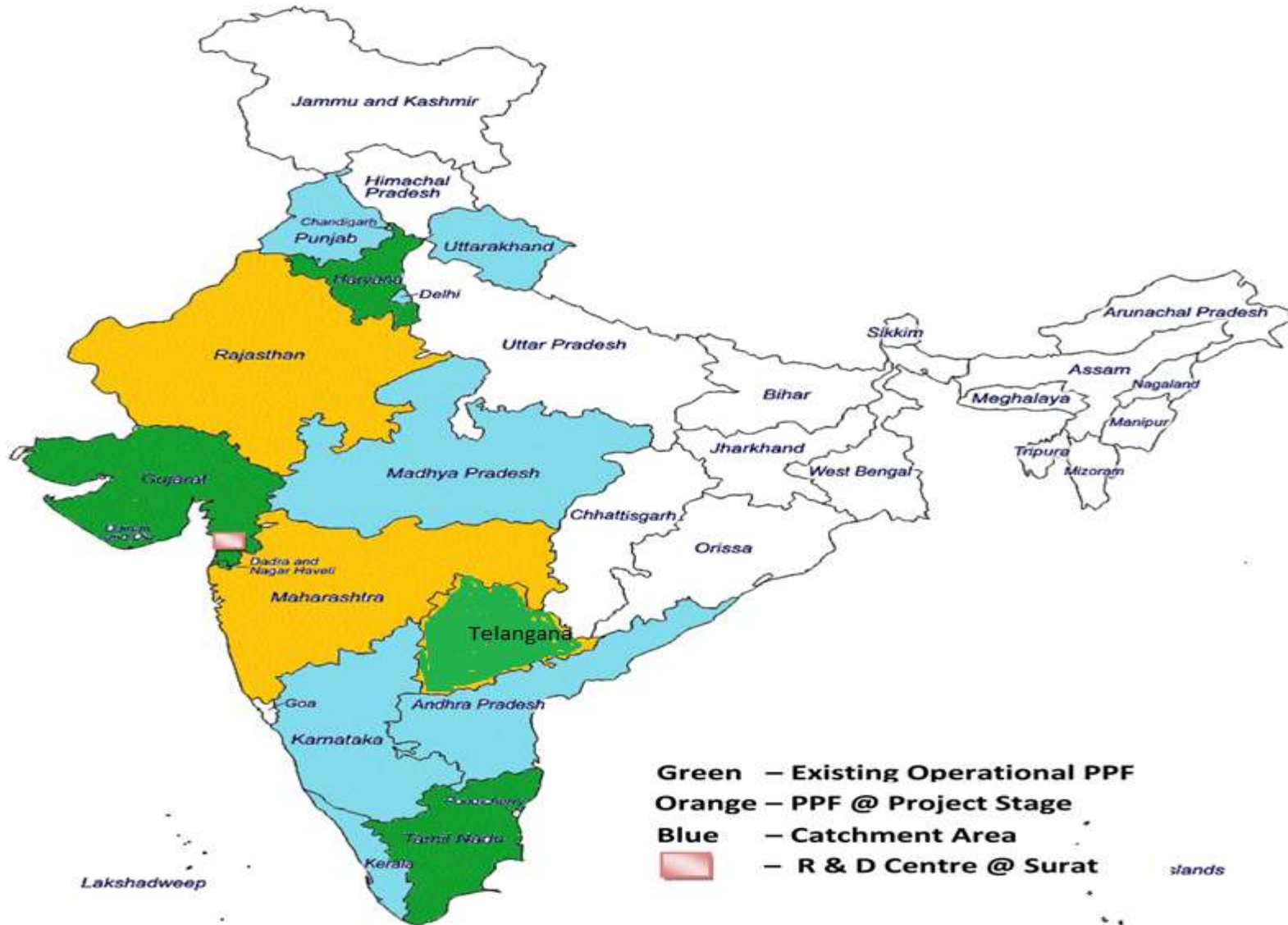
- Hazardous waste generation is bound to increase with “make in India” need.
- Present Method of “ Treatment and Disposal” is not sustainable
- Need to minimize the Incineration and Landfill
- Direct Co-processing has Limitation

PRE-PROCESSING FACILITY- WHY??

- Pre-processing Facility can partially cater to the “Need of the day”
- PPF is universally adopted and has been a proven approach
- It is present in India since last 7-8 years
- It is “proven” that large amount waste can be pre-processed and converted into acceptable, uniform quality of fuel.

GEPIL's EXPERIENCE IN PRE-PROCESSING

- Five Operational Pre-processing Facility across India.
- Three Facilities are in Project Stage.
- Producing 8000 -10,000 TPM of Alternate Fuel (AF)
- Targeting to produce 20,000/- TPM of Alternate Fuel (AF) by March 2018.
- Closely working with Lafarge, Dalmia, J K Cement and other cement plants.



WASTE HANDLED

SECTORS	WASTE TYPE
Chemical	<ul style="list-style-type: none">• Distillation Residue• Process Waste• Spent Carbon• ETP Sludge• Sludges
Agro Chemicals	<ul style="list-style-type: none">• Process Residue• Distillation Residue• Tarry Waste• Off Specification Products
Drugs and Pharma	<ul style="list-style-type: none">• Spent Organic Solvent• Spent Mother Liquor• ETP Sludge
Textile	<ul style="list-style-type: none">• Chemical Sludge from waste water• Distillation Residue

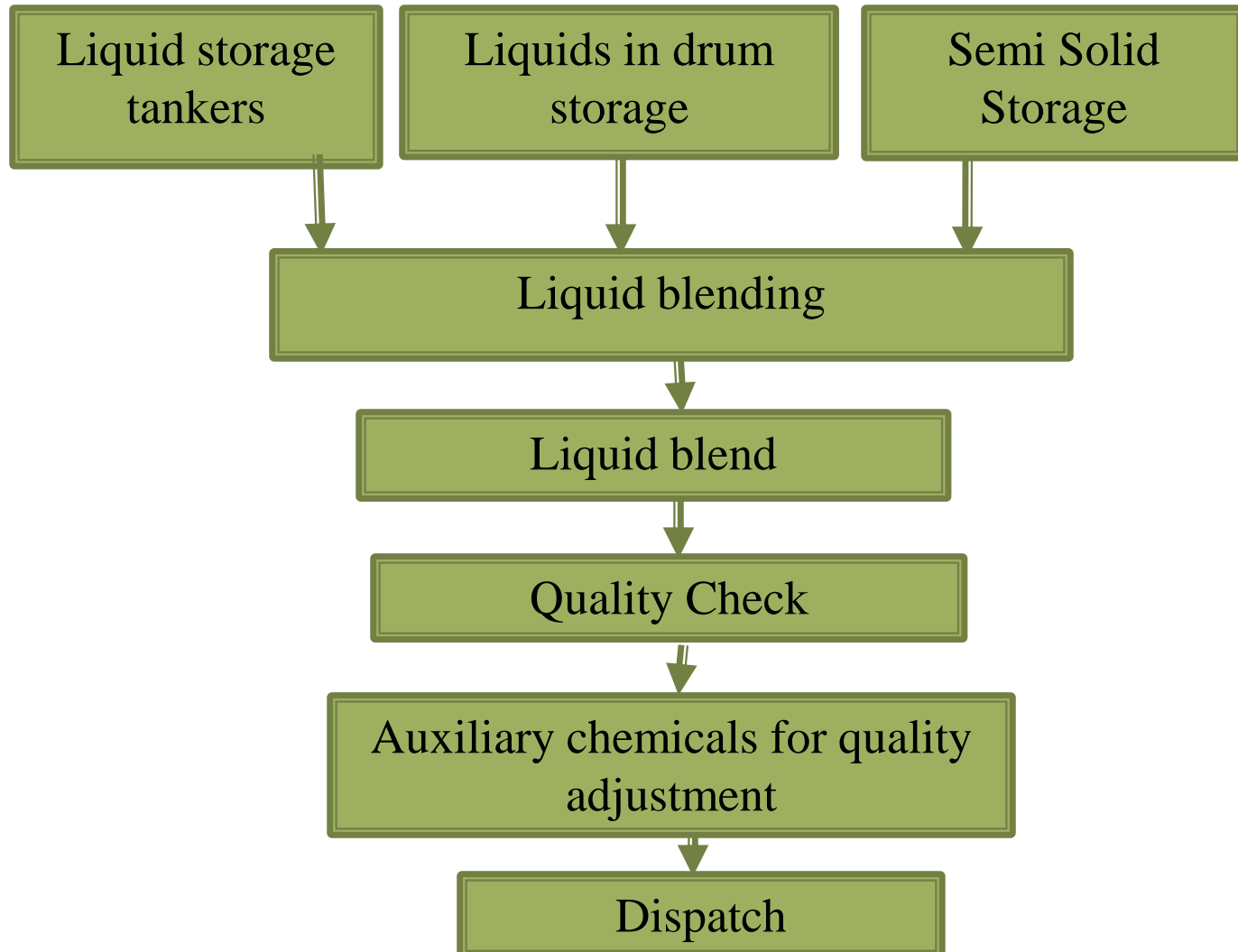
WASTE HANDLED

SECTORS	WASTE TYPE
Petro-chemicals	<ul style="list-style-type: none">• Oily Sludge• Used Oil• Spent Catalyst• Cotton Waste• Spent Carbon• Oil Soaked Cotton
Auto	<ul style="list-style-type: none">• Phosphate Sludge• Chemical Sludge• Paint Sludge• Sealant Waste• ETP Sludge
Wind and Power	<ul style="list-style-type: none">• Resin Waste• Doughy material• Process Waste
Engineering	<ul style="list-style-type: none">• Cutting Waste• Oily Sludge• Grinding

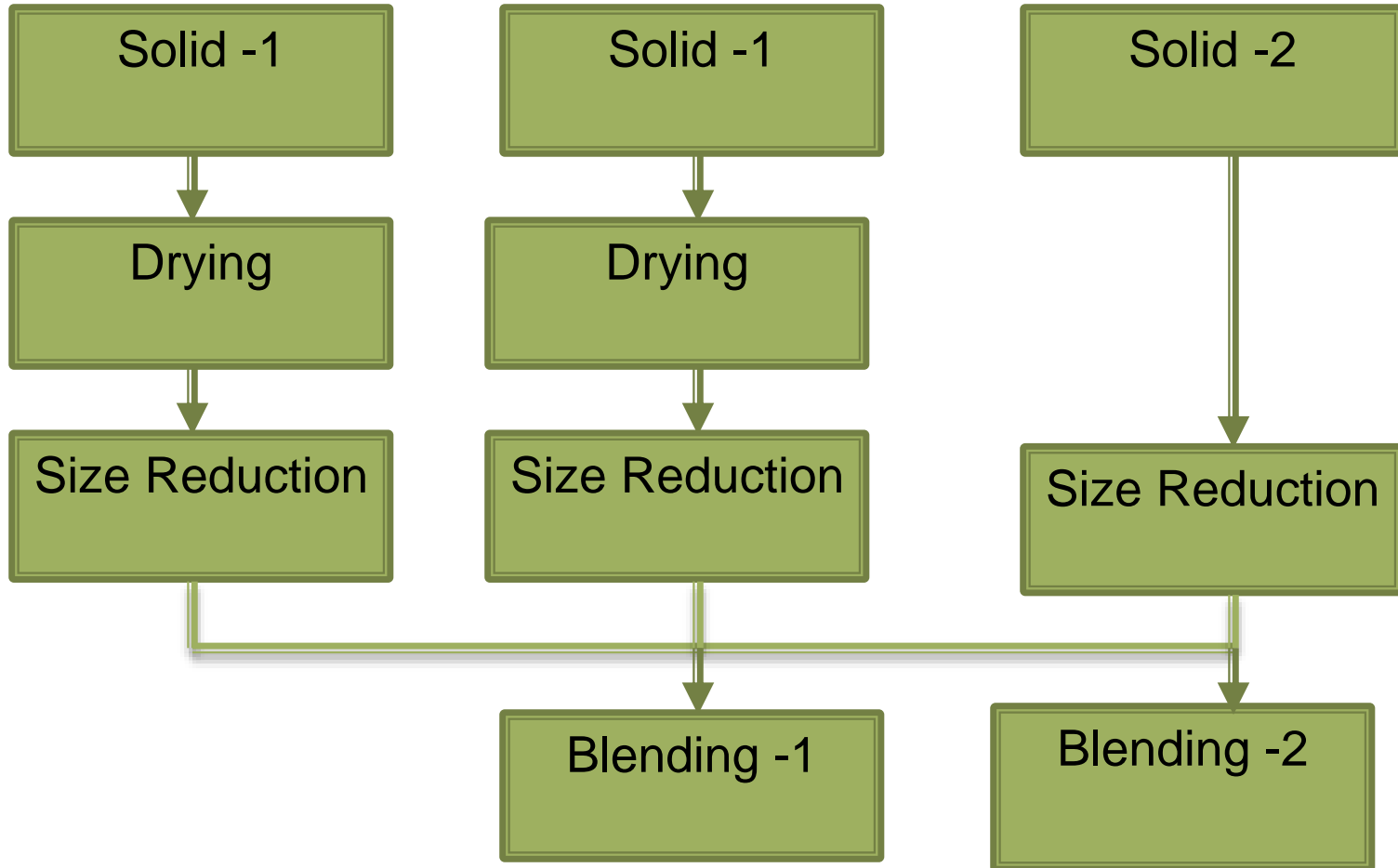
PROCESS

Process	Product
Liquid –Liquid Blending	Liquid Mix
Liquid- Semi Solid Blending	Liquid Mix
Semi Solid- Solid Blending	Solid Mix
Solid –Solid Blending	Solid Mix

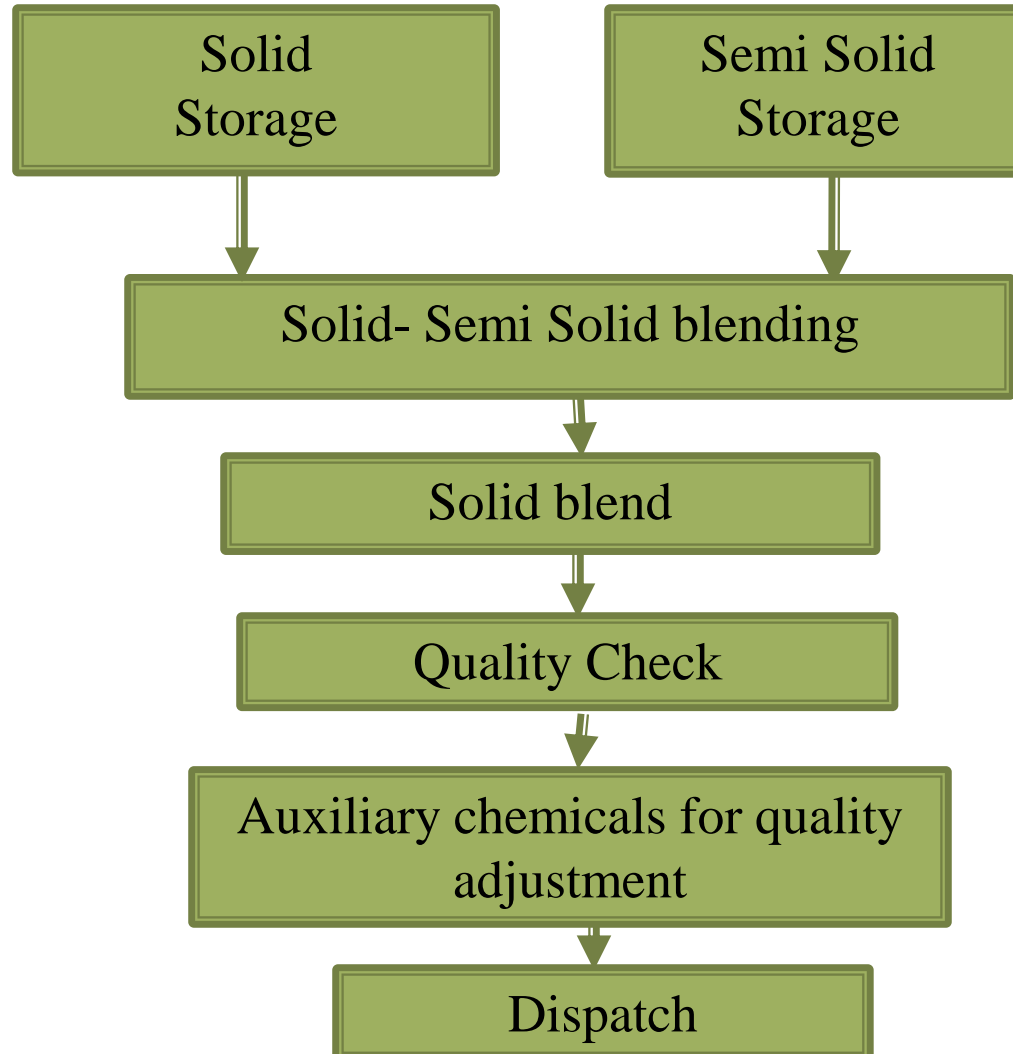
LIQUID PROCESSING



SOLID PROCESSING



SEMISOLID PROCESSING



FUNCTIONING OF PRE-PROCESSING FACILITY

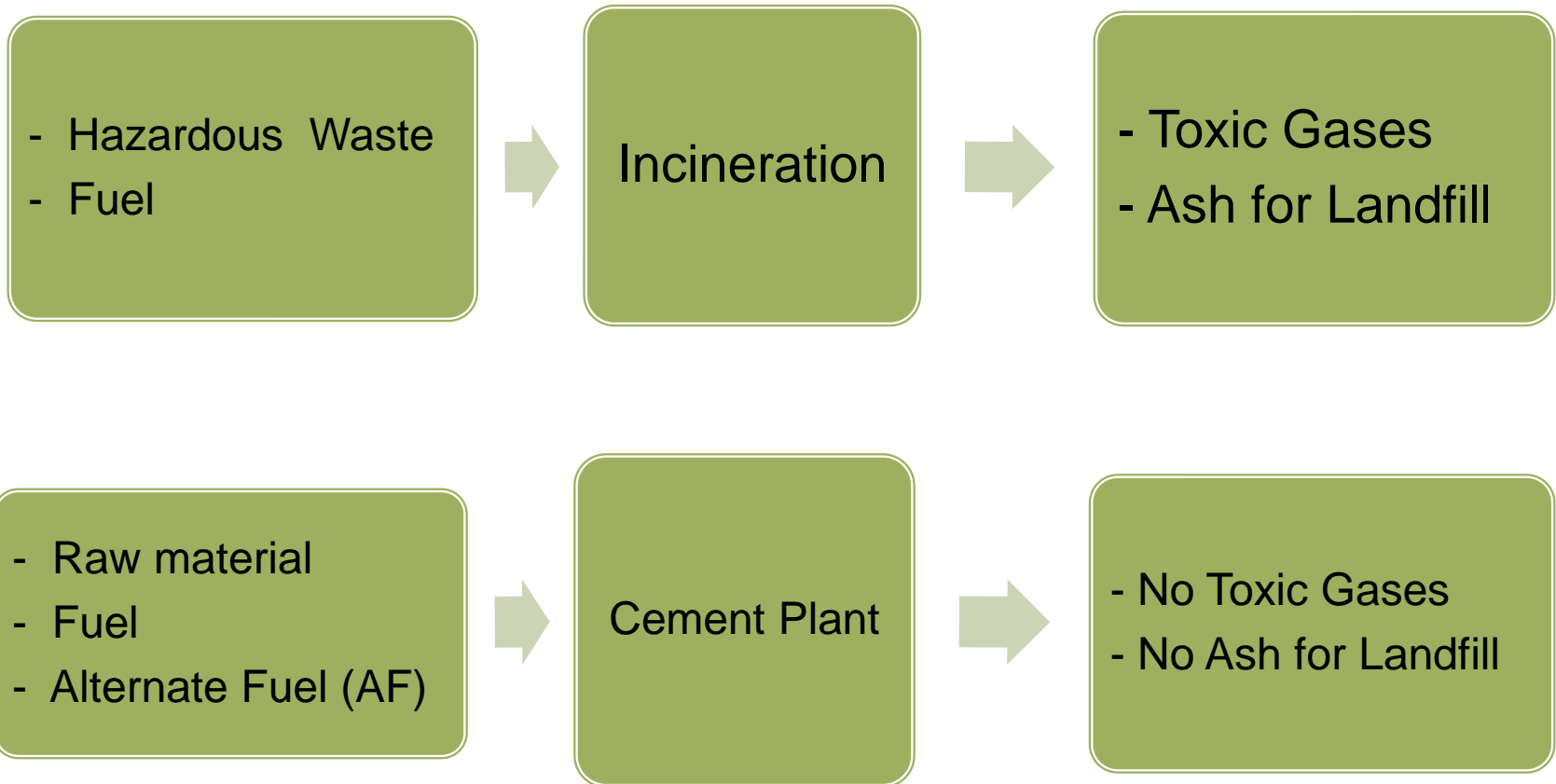
The proposed functioning of the Waste Mix Processing Facility shall be carried out and explain in detailed as following.

- 1.Finger Print Analyses and Waste Selection
- 2.Registration of Companies and their waste with WMPF facility
- 3.Waste Transportation
- 4.Waste Receipt and Quick Check analyses
- 5.Waste Storage
- 6.Recipe Preparation
- 7.Process
- 8.Quality check of alternate fuel
- 9.Dispatch of alternate fuel to cement industries

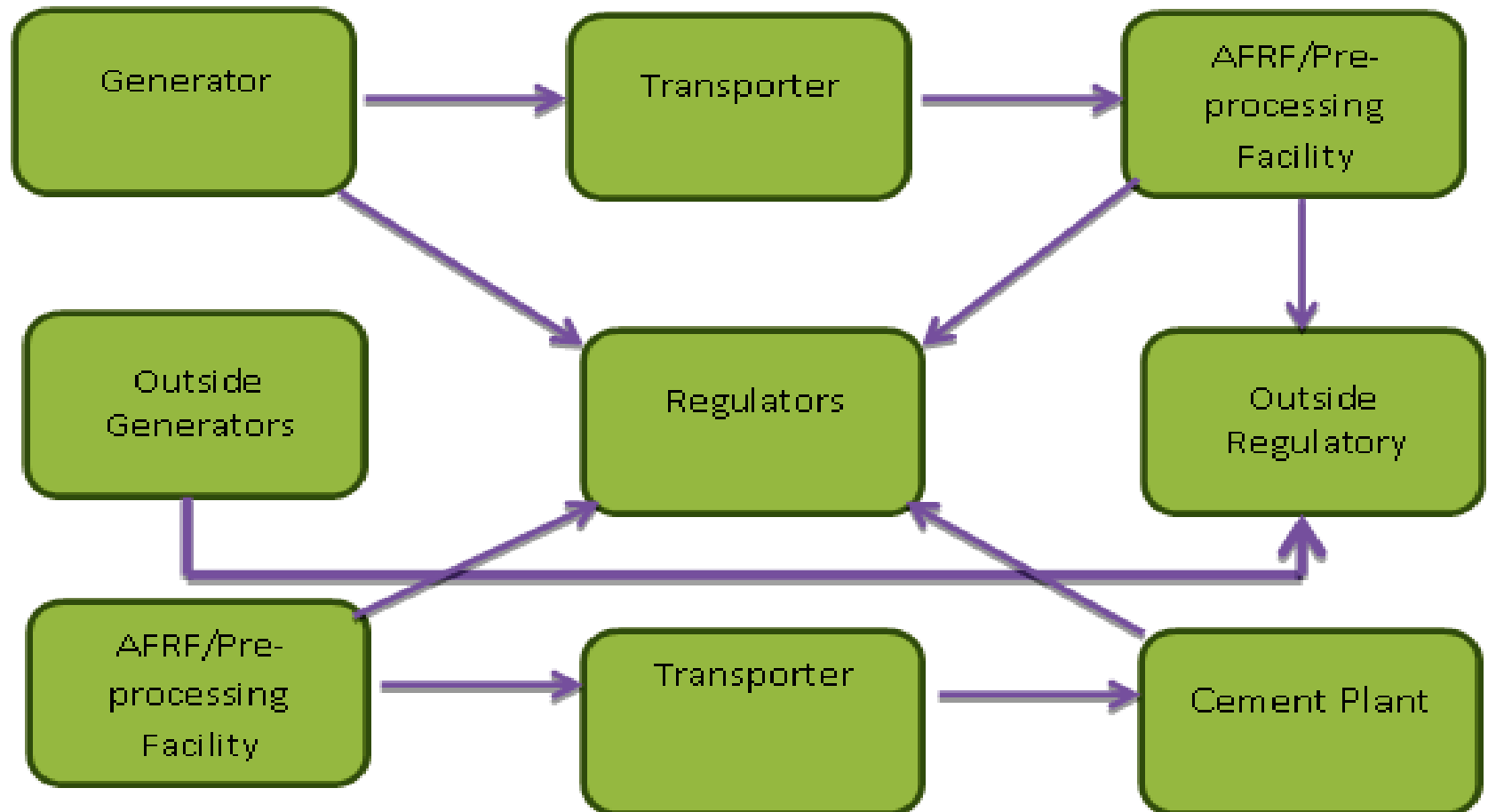
UNIT OPERATION

- No unit process and chemical reaction
- No High Temperature, high pressure operation
- Zero Waste Water Discharge facility
- Zero emission (only DG when operated)
- Zero Residue generation
- It generate the empty drums/containers and it shall be given to authorized drum recyclers.

ENVIRONMENT BENEFITS OF PPF



MANIFEST SYSTEM



PRE-PROCESSING FACILITY -HARYANA

Intermediate Storage



Overview of Facility



PRE-PROCESSING FACILITY - DNH

Overview of Facility



PRE-PROCESSING FACILITY- PANOLI & RANIPET

Plant Building



Plant Building



PREPROCESSING FACILITY

Plant Building



PREPROCESSING FACILITY

Solid Processing Area



Liquid Processing



PRE-PROCESSING FACILITY

Loading/Unloading Area



Liquid Storage Facility



PRE-PROCESSING FACILITY

Storage Area



Storage Area



TRANSPORTATION FACILITY



TRANSPORTATION FLEET



R&D CENTRE



R & D AND LAB



EXPERIENCES

EXPERIENCES

- **Generators and Market Related**
 - Co-processing Credibility is in question
 - One More Agent, One More cement players
 - No long term commitments
 - Try, test and then commit.

- Highly Competitive

- Authorization qty, Commitment Qty, Actual Qty and actual types – There are huge variations

- Highly tarry waste with 30% chloride and even salts are being taken for Co-processing

EXPERIENCES

- The Rate of Incineration has started decreasing and Landfill has Increasing.
- No Tracking of hazardous Waste in the states.
- Emphasis on “GPS enabled” Vehicles with online tracking”
- Few Corporate Groups avoiding “Landfill” and preferring Pre-processing even by paying “Higher Price”

EXPERIENCES

ACCEPTABLE LIMITS

- All wastes (solid, Semi Solid, Liquid)
- Non Fumigative
- Any CV
- Chloride up to <20%

EXPERIENCES

- No Waste Water generated from Process
- No Air emission generated from process
- Residue (Mainly from Reject) < 2 %

EXPERIENCES

- Health and safety is bigger concern than environmental compliance

EXPERIENCES

- Handling and storage is bigger concern over Processing.
- Packaging.
- Transparency in conveying Raw Waste quality.

SOME SAFETY PRECAUTIONS

- All VOC generated areas and electric area are isolation to the extent.
- Use of “Air line Respirator instead of cartridge masks.
- Heat Detectors
- VOC Sensors
- Zoning
- Storage and Process area isolation
- Receiving of all waste on Pallets (Drum and 1 Ton Jumbo Bag) to avoid manual handling

SOME SAFETY PRECAUTIONS

- Passages all over the storage and process area
- Minimum storages (< 7 days)
- Q.C of each and every drum and lot wise Segregation
- Control of “Odor and Smell” while storage and Unloading
 - Packing Condition
 - O.D.S
 - Extraction system
 - Isolations
- Waste Safety Data Sheet (W.S.D.S)

PROCESSING

- Waste Compatibility.
- Different kind of Blenders along with various feeding and removal Mechanism.
- In built safety features
- Extraction system
- Mechanization and isolation
- Modular System

PRODUCT QUALITY

- Free Flowing
- Particle Size
- Chemical Prosperities

PRODUCT QUALITY

Sr. No	Product	Characteristics
1	Solid Waste Mix	<ul style="list-style-type: none">• CV > 3500• Ash < 25%• Cl < 2.5%• Moisture < 20%
2	Liquid Waste Mix	<ul style="list-style-type: none">• CV > 3500• Ash < 5%• Cl < 3%• Moisture < 20%

PRODUCT QUALITY

Parameters	Waste Mix - Solid	Waste Mix – Liquid
Calorific Value - As received basis (k Cal /kg)	3600+/-200	3600+/-200
Water (YO)	<20	<20
Flash Point - Deg Centigrade	-	>60 Degree C
Chloride (%)	< 1.5 to 3	<1.5 to 3
Total Halogens (F +B+ I) (%)	<3.0	<3.0
S (%)	<1.5	<1.5
Viscosity (cSt)	NA	<70 cSt
PCB/ PCT (ppm)	<50	<50
Heavy Metals (ppm)		
Hg	<10	<10
Cd+Tl+Hg	<100	<100
As+Co+Ni+Se+Te+Sb+CrtSn+Pb+V	<2500	<2500
pH	5 to 9	5 to 9
Sediments	NA	0.5%
Free Solids	NA	<3%
Ash	<30 %	<5 %

MANAGEMENT OF CONTAINERS

- Decontamination and giving it to Authorized Recycler.
- Decontamination and Utilizing Within

TRANSPORT OF ALTERNATE FUEL

DEDICATED TRUCKS



DEDICATED TANKERS



MAJOR SAFETY FEATURES

- GPS Fitted
- Valves with control procedures
- Covered under PLI policy
- Training of Driver
- Breather valves
- Fire extinguishers

CHECKLIST FOR TRANSPORTATION

S No	Action Points
1	Whether PPEs - Organic Vapour Mask, Nitrile hand gloves, Safety Helmet, Safety shoes, Safety glass, protective clothing, high visible jacket available?
2	Valid of antidote available inside the vehicle
3	Whether the drivers are aware about how to use antidotes?
4	Driver aware about the antidote availability and use
5	Whether vehicle fitted with Spark Arrestor?
6	Condition of seat belt for driver and conductor side
7	Test date due for fire Extinguisher
8	Type of fire extinguishers (DCP/Foam type)
9	Whether all the first aid items with valid expiry date are available in first aid box
10	Number of points sealed applied on tankers at GEPIL
11	Whether the keys are send at SCP for unlocking
12	Whether Manifest at three location as per norms painted
13	Pollution Under Control Certificate (PUCC)
14	Approval copy of vehicles from PCB is available in Vehicle
15	Owner books copy is available
16	Driver have valid licene and he authorised to carry the hazardous Material
17	Valid vehicle fit certificate is provided by RTO
18	Valid Insurance copy of the vehicles are available Whether the vehicles have valid permit?
19	Emergency Contact Nos of GEPIL, Fire Stn, Ambulance,Police - available at tanker and Driver made aware
20	Compliance of Statutory requirement of CMVR-99, MVA-14 (2), CMVR 134, CMVR 132, 134 and 137

S No	Action Points
21	Vehcile Permit per Central Govt. Motor Act 1988
22	Test Certificate of the material tested at GEPIL lab
23	Copy of Pollution control boards availabe
24	Availablity of TREM Card
25	Whether driver is tranined on TREM cards
26	Defined transport route, Tracking Mechanism in place - GPRS/ Check at identified halts/ nodal points
27	Whether seals valves and connections are airtight
28	Whether there is any leakage of chemical from the tanker
29	Spill response and Emergency Plan known and in place
30	Drivers trained on handling waste in case of emergency like leakage, fire etc.
31	Instruction class taken in Hindi & Local Languages
32	Break condition
33	Wipper in working condition (Mandatory in raniy season)
34	Self starter condition
35	Head light condition
36	Side indicator condition
37	Drivers Side Rear View Mirror
38	Stopper
39	Brake Light
40	Back Horn
41	Side Indicator
42	Reverse light
43	Left Side Rear View Mirror
44	Back Light
45	Reverse Light
46	Tyre Condition Good / Average

ISSUES AT CEMENT PLANT

- Unloading
- Storage
- Feeding
- Packaging
- Safety Aspects
- Distances (250 Km to 1200 Km)
- Smell / Odor
- IR Aspects

“ BEST CASE SO FAR”

“ CONSISTENT AND SUSTAINABLE”

FEEDING OF

ALTERNATE FUEL @ 200 T/ Day

VIEWS TO PROMOTE PROCESSING

CO-

VIEWS TO PROMOTE CO-PROCESSING

- Stronger regulation /Vigil on recyclers of solvent and Oil
- “On line Tracking” and “Authorization only to user” will Minimize illegal hazardous waste transport and disposal.
- Stronger enforcement of “Waste water disposal” by ETP/ CETP will Increase generation and improve quality of sludges exponentially.
- Development of “storages and facility Infrastructure” at cement companies.
- Stronger enforcement and Monitoring of landfill will minimize disposal of organic hazardous waste.
- Use of “Controlled quality” AF will ensure
 - No disturbance in production
 - No disturbance in handling
 - No disturbance in Environment and Compliance

VIEWS TO PROMOTE CO-PROCESSING

- Focus on other wastes as well because “supply of Hazardous Waste” is much lesser compared to need of cement plant.
 - RDF
 - Plastic Waste
 - Agriculture waste
- Avoid “Direct Co-processing” of difficult waste.
- Good Co-ordination between Generator –PPF –TSDF-Cement Companies.
- Review of list of hazardous waste permitted for Direct Co-processing

THANK YOU