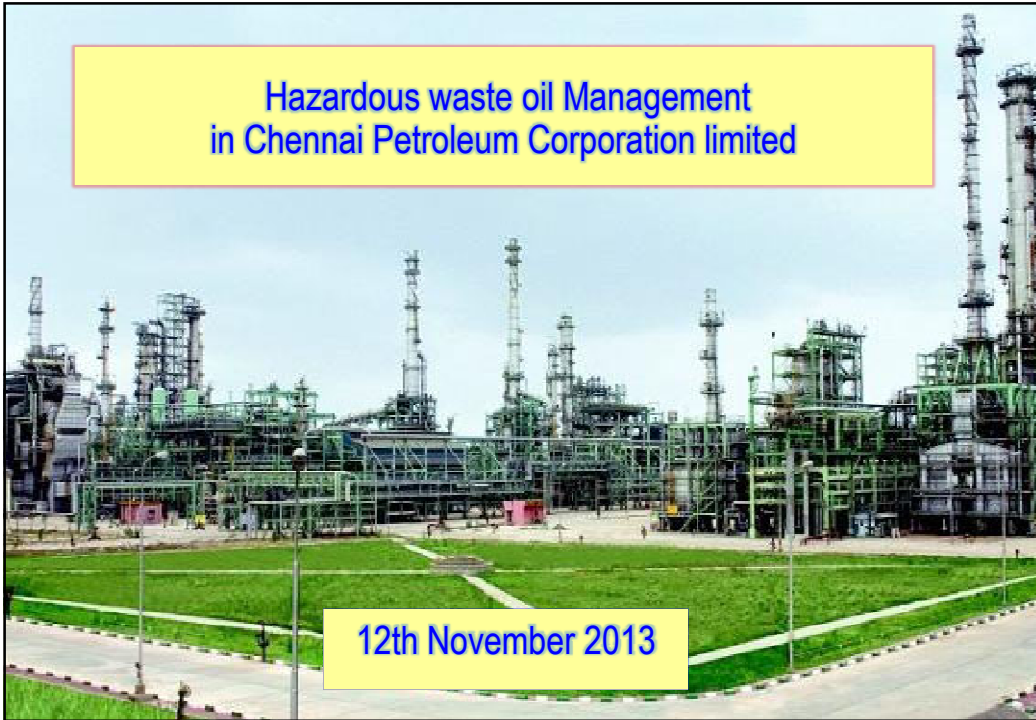
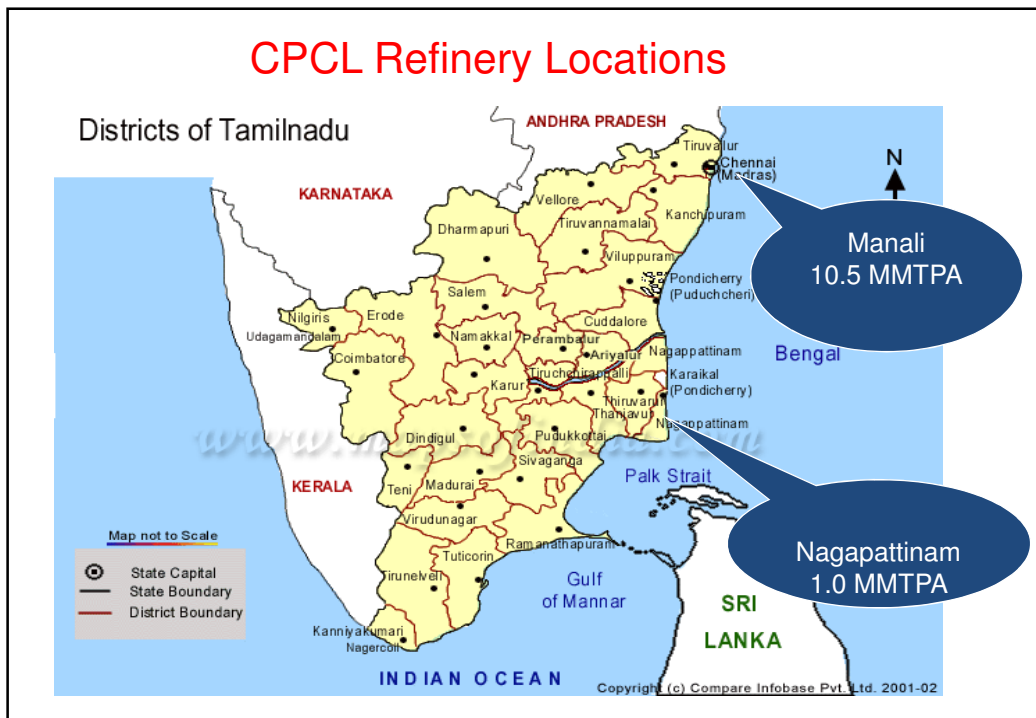


Hazardous waste oil Management in Chennai Petroleum Corporation limited



CPCL Refinery Locations



Product Profile

FUEL PRODUCTS

• LPG	380
• MS	1000
• SK /ATF	1000
• HSD	3700
• FO	1400
• Bitumen	430
• LOBS #	200

Lube Oil Base Stock

(Quantity in TMT/annum)

SPECIALITY PRODUCTS

• Hexane	12
• Extracts	50
• Wax	25
• CRMB	60

FEED STOCKS

• Propylene	28
• MEKFS	8
• PBFS	8
• Naphtha	700
• LABFS	50

Hazardous waste Management

Responsibilities of Hazardous Waste Generator as per Hazardous waste rules 2008

**Ensure handling and disposal of Hazardous waste
with out any adverse effects either by Himself or
through an authorized agency**

Hazardous waste Management

What is Hazardous waste ?

Haz waste rules 2008

Schedule I & Schedule II

What is the impact of Haz waste if not handled properly

How it should be handled & disposed?

Should we really dispose or is it possible to reuse them?

Hazardous waste Management

What is Hazardous Waste ?

Schedule I : 36 Processes & 115 items

3.0 Cleaning emptying & maintenance of petroleum oil storage tanks:

3.1 Oil containing residue, wash water & sludge

4.0 Petroleum Refining :

4.1 oily sludge emulsion

4.2 slop oil

Hazardous waste Management

What is Hazardous Waste ?

Schedule II : 6 classes; constituents with concentration limits. If conc is equal to greater than limits defined as Haz. waste

Class C item C-8 aromatics : 2% by Wt

Class D item D-5 Total Hydrocarbons 5% by Wt

Environment Management in CPCL

**Hazardous wastes rules 2008
(Management Handling & Transboundary Movement)**

Waste oil definition

Any oil which includes spills of crude oil, emulsions tank bottom sludge & slop oil generated from petroleum refineries, installations or ships and can be used as fuel in Furnaces for energy recovery, if it meets the specification laid down in part B of Schedule V either as such or after reprocessing

Environment Management in CPCL

Waste oil definition

Definition of waste as an adjective

Discarded , no longer useful

No longer required

after completion of process

Environment Management in CPCL

Definition of disaster

A Disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources.

Caused by nature as well as by Human activities

Hazardous waste Management

What is the impact of Haz waste if not handled properly

Fire hazard within /outside (if escapes beyond the boundary)

Air pollution due to evaporation of Volatile components

Air pollution due to incineration

Surface water pollution due to leaching/contamination

Ground water pollution due to leaching /percolation

Hazardous waste Management

Fire hazard within or outside plant (if escapes beyond the boundary)

- Prevent oil spill**
- Contain oil spill within limited area**
- Recover spilled oil**

Ensure spilled oil does not cross plant boundary

Hazardous Waste Management

- 1. Recover valuable Material from HW and reduce volume**
- 2. Supply to someone who can use without affecting Environment (Authorized recyclers), Cement Industries, Manufacturers of Precast slabs/bricks**
- 3. Bio-remediation & make it suitable for land filling**

Hazardous Waste Management

Recover valuable Material from HW and reduce volume

Maximize recovery of oil by thermal/chemical/Mechanical means

Thermal : heat above melting point, separate liquid portion

**Chemical: Add Demulsifier & remove water
Add Light hydrocarbons & extract**

Mechanical : Filtration or centrifuge

Environment Management in CPCL

- Factors affecting environment in Refining operations
- Crude oil – Type, (sweet/sour) storage, preparation for processing
 - Sulfur, Sludge formation & water draining : carryover of oil
- Various refining processes involving Heat input
 - by use of Fuel oil, Fuel Gas in heaters/boiler
- Transportation of Hydrocarbons in Gaseous & liquid state
 - Pumps, compressors, possibility of leak
- Use of various chemicals which are hazardous
 - MIBK, NMP solvents, Chlorine, HCL
- Use of steam for stripping volatile component
 - Separation of water & Hydrocarbon by settling & carryover possibility

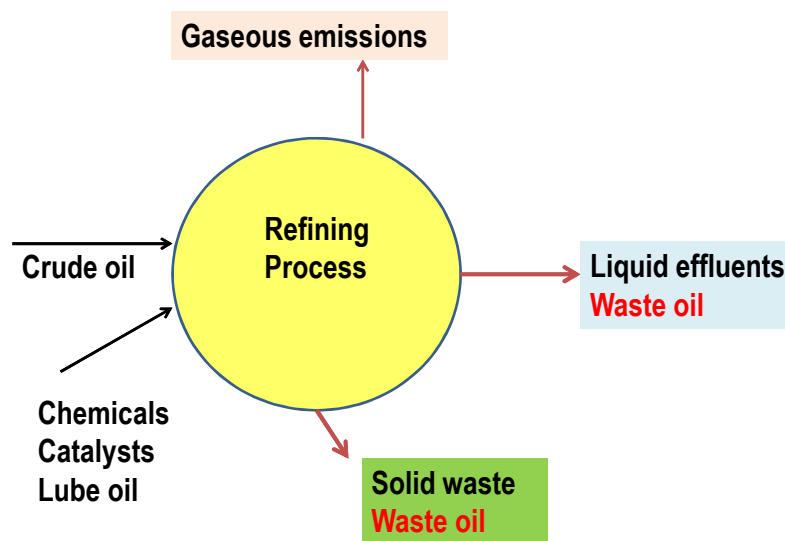
Environment Management in CPCL

- Some important Pollutants in Refining operations
- Hydrocarbon itself is a pollutant in various states – vapor, liquid, solid
- Sulphides, Mercaptan, Mercaptides
- Captive power plant – demineralization- acidic effluent
- Boiler, cooling water treatment chemicals
- Boiler Blow downs, cooling water blow-downs
- Reject water from Reverse Osmosis Process
- Products of combustion from heaters/ boilers
- Catalyst fine particles – particularly FCCU
- Spent catalyst, Adsorbents, filter media
- Crude tank bottom Sludges
- Used Lube oil

Environment Management in CPCL

- Some important Pollutants in Refining operations
- Used Lube oil
 - Lubrication of rotary equipment
 - Engine oil of diesel driven rotary equipment

Environment Management in CPCL



Environment Management in CPCL

Three major areas

- **Wastewater Management : Waste oil**
 - Liquid effluent treatment, Recycle & Reuse
- **Air Pollution Control**
 - Monitoring & Control of gaseous emissions
Fuel quality, Low Nox-Burners, LDAR
- **Solid Waste Management- Waste oil**
 - Treatment, Recovery , reuse and safe disposal

Environment Management in CPCL

Liquid effluent- Collection systems

- **Closed Blow Down- CBD**
- **Oil Water Sewer – OWS**
- **Contaminated Rain Water System –CRWS**
- **Storm water Ponds**

Environment Management in CPCL

Storm water- Collection systems

- Storm water canal & Ponds
- Oil traps/oil catcher
- Oil overflow weir
- Floating Oil skimmer
- Floating oil boom
- Floating oil suction Nozzles
- Oil rich stream separated & transferred slop tanks
- Oil lean stream transferred to Effluent treatment plant feed tanks
- During monsoon water under flow/dewatering

Environment Management in CPCL

Liquid effluent

3X200 M3/Hr Effluent treatment plants

- Free Oil & Suspended solids removal by settling, Coagulation, Flocculation.
- Emulsified oil removal by Dissolved Air Floatation (DAF)
- Sulfides removal by Ferric Chloride, Hydrogen-Per-Oxide
- BOD & COD removal by Bio-Treatment.
- Ultra filtration to remove submicron particles
- Reverse Osmosis to remove TDS
- Total Recycle of treated effluent

Recovered-Oil is reprocessed along with Crude oil

Environment Management in CPCL

Solid waste Management- Tank Bottom sludge

In-situ thermal, chemical- treatment, Mechanical treatment to recover oil

Steam heating, Diesel mixing, centrifuging

- **Water separated processed in ETP**
- **Oil recovered mixed with Crude oil**
- **Sediments with oil content (10-15%) sent for bio remediation**

Bio-remediation of sediments to make it suitable for land filling

**Mixing with microbes & nutrient
Tilling & water addition**

Environment Management in CPCL

Solid waste Management- ETP sludge

1. Oily sludge from API, TPI separators

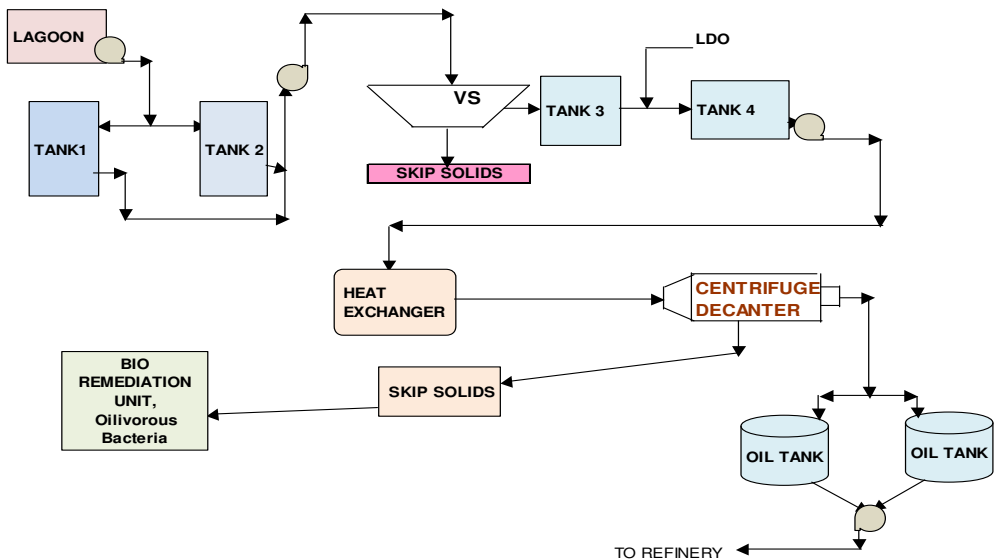
Transferred to Mechanical treatment system followed by bio remediation

2. Chemical- sludge from DAF, Clarifier

Thickener, centrifuge, disposal in TSDF

Recovered oil blended with crude oil in both cases

Mechanical treatment of oily Sludge



➤ Mechanical Treatment of Oily Sludge



Bio-Remediation

Before



After

