

ENVIRONMENTAL MANAGEMENT PLAN OF INTEGRATED MEAT PROCESSING UNIT

By

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Al-Kabeer Exports Pvt. Limited

Rudraram



M/s Al-Kabeer Exports Pvt. Ltd

A modern integrated meat processing unit at Rudraram village, Patancheru Mandal, Medak district of A.P. Started in 1993.

100% export oriented mechanised slaughtering unit.

Slaughtering capacity of 2000 sheep and 1000 buffalo per day.

The plant is spread across 300 acres of land of which 250 acres used for on land irrigation and aqua culture.

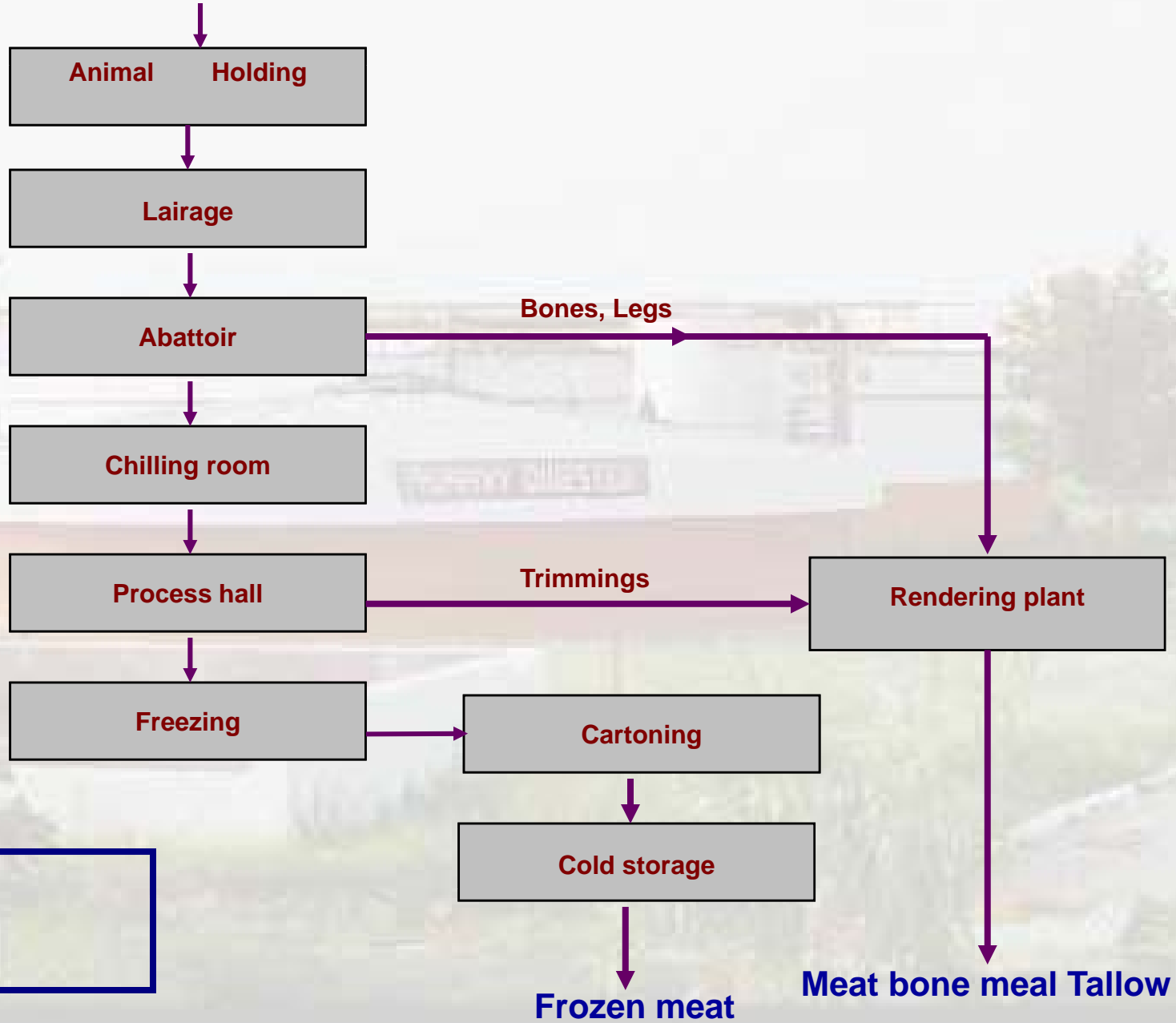
Products

- Frozen buffalo meat 50 Tons/day
- Frozen sheep meat 12 Tons/day

By Products

- Meat bone meal 35 Tons/day
- **Tallow** 12 Tons/day
- Pet foods 4 Tons/day
- **Hide** 500 Nos./day
- Skin 1500 Nos./day

RAW MATERIAL BUFFALO / SHEEP



**PROCESS
FLOW**

Waste water generation Points

- **Animal holding**
- **Abattoir**
- **Rendering Plant**

Carcass, machinery and floor washings is the source of waste water.

Prominent Impurities - blood, proteins, fat, particles of meat, hair

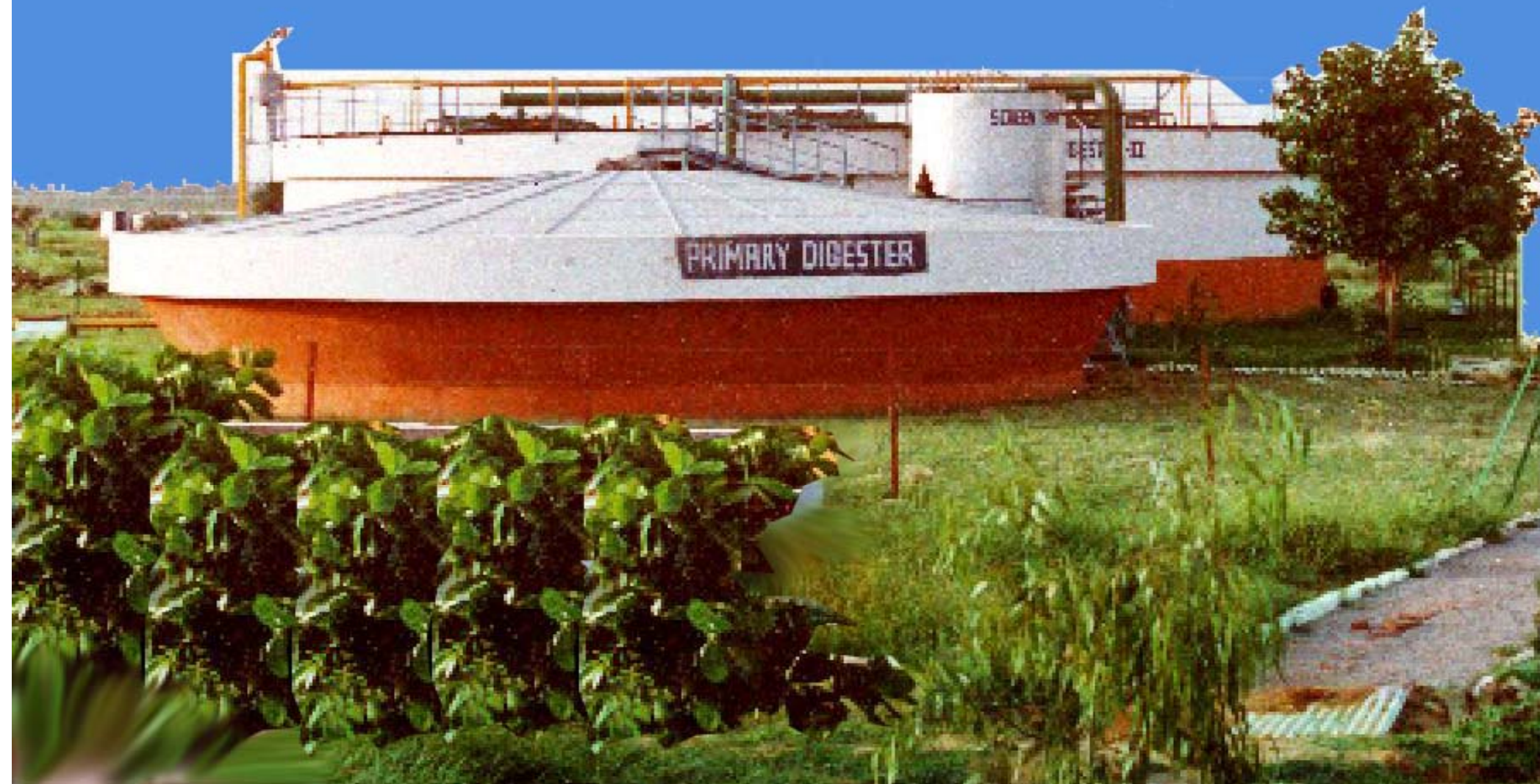
EFFLUENT CHARACTERISTICS

Flow - 1400 cum/day

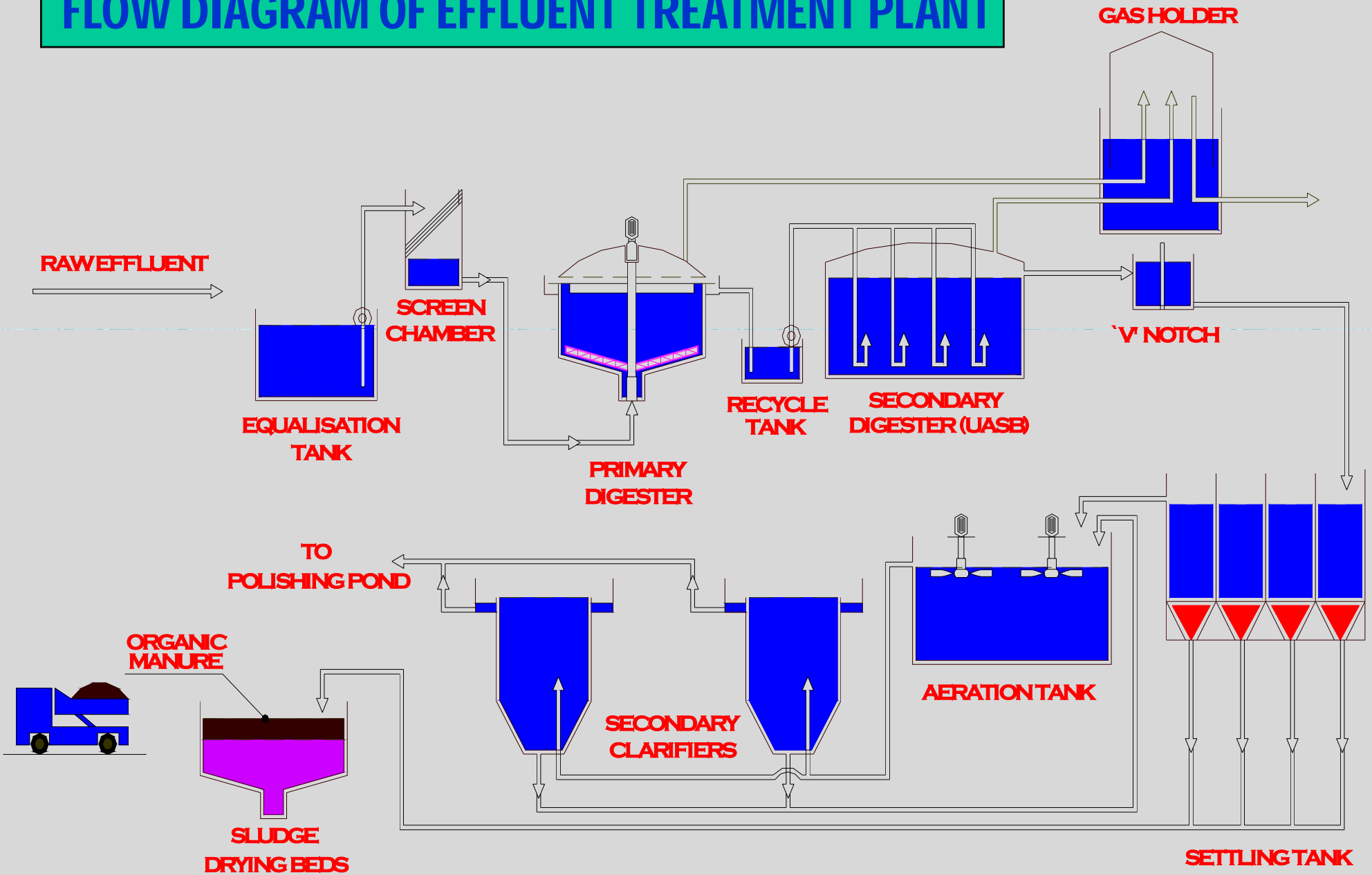
- pH 6.5 - 8.5
- Total Suspended Solids 2000 - 3000
- Total Dissolved Solids 1000 - 2000
- COD 6000-8000
- BOD 3000-4000

All values except pH are in mg/l

Effluent Treatment Plant



FLOW DIAGRAM OF EFFLUENT TREATMENT PLANT



BIOMETHANATION OF EFFLUENT

- **Technology** → **Up flow Anaerobic Sludge Blanket (UASB) Process**
- **Advantages** → **No energy Inputs, Bio gas recovery**

UASB PROCESS DETAILS

- Salient features

Gas Solids Separator

Feed inlet distribution

- PROCESS

Retention Time

24 Hours

Organic Loading Rate

3-4 kg/cum/day

COD to Biogas conversion

0.345cum/kg COD

destroyed

Efficiency (COD removal)

85%

PRODUCTS OF BIOMETHANATION

- **BIOGAS**

Volume 1000cum/day

Composition **CH₄ 60-64%**
CO₂ 36-40%

- **SLUDGE**

Quantity 1 Ton/day

Composition

Nitrogen 4-6%

Phosphorous 0.6-1.0%

Potassium 0.2-0.5%

AEROBIC TREATMENT

- **Type of Aeration - Extended Aeration**
- **Type of aerator - Mechanical Surface Aerator**
- **MLSS - 1500mg/l**
- **F/M - 0.2**
- **Inlet BOD - 400mg/l**
- **Outlet BOD - 80mg/l**
- **Efficiency - 80%**

TREATED EFFLUENT CHARACTERISTICS

- **pH** **7.5**
- **Total Suspended Solids** **<100**
- **Total Dissolved Solids** **<1900**
- **COD** **130**
- **BOD** **40**

All values except pH are in mg/l

REUSE OF TREATED EFFLUENTS

- **PISCICULTURE**

Area - 20 Acres

No. of ponds - 16

Type of Fish - snake heads, thilopia, cat fish, Indian carps (rohu, catla)

- **AGRICULTURE**

Area - 160 Acres

Plantation - 1. Coconut; 2. Banana

3. Mango; 4. Cashew; 5. Teak

Crops - 1. Paddy; 2. sugarcane

HIGH RATE BIOMETHANATION OF 60 TONS / DAY SLAUGHTER HOUSE SOLID WASTE



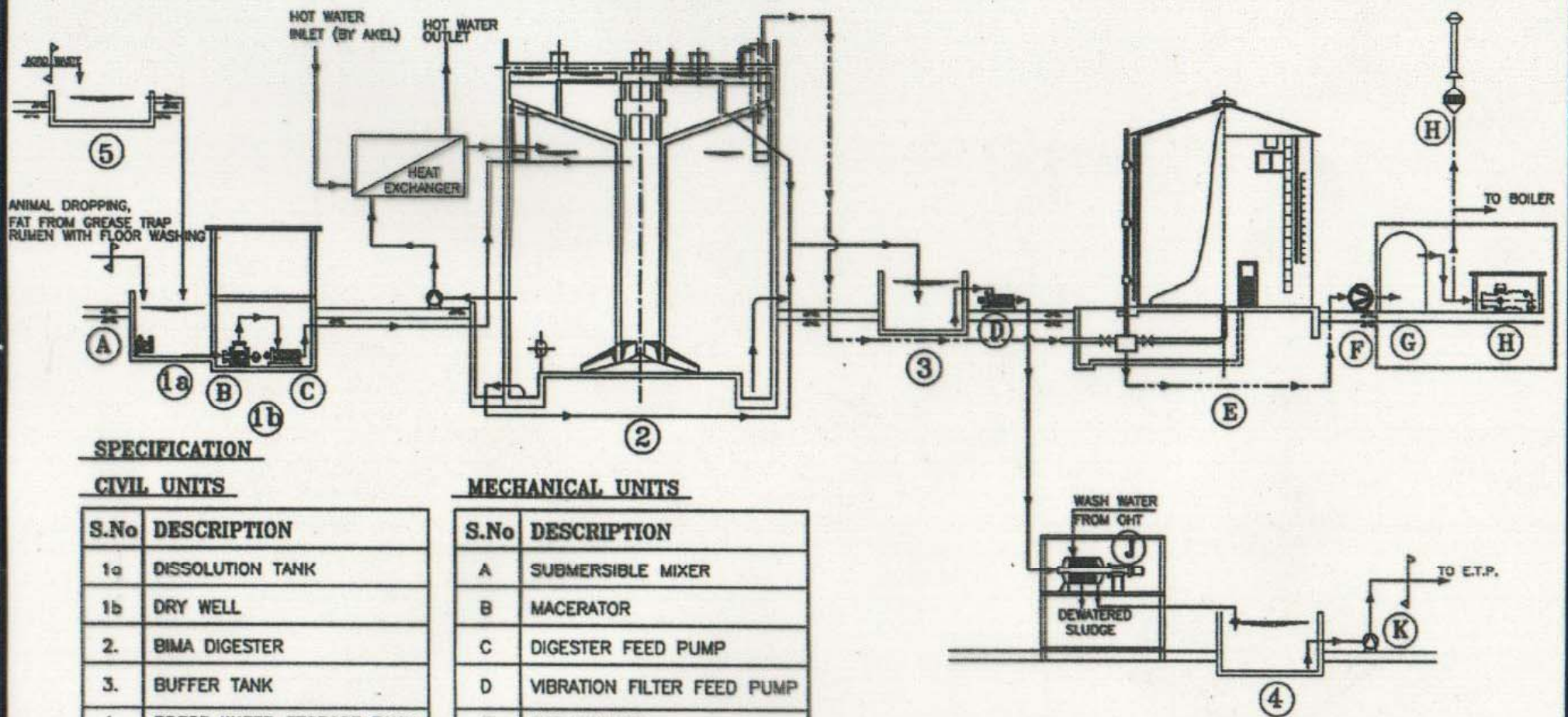
AT AL-KABEER EXPORTS PVT. LIMITED. HYDERABAD

WASTE QUANTITY

Type of Waste	Quantity (tons/day)
Droppings (Dung)	20
Rumen & Others (Paunch)	25
Fat (from grease trap)	5
Agro waste	10

WASTE CHARACTERISTICS

TYPE OF WASTE	CHARACTERISTICS		
	Moisture content (%)	Dry Solid (DS) (%)	Volatile Solids (VS) (%)
Droppings (Dung)	85.0	15.0	70.0
Rumen (Paunch)	89.0	11.0	83.0
Fat	90.0	10.0	90.0
Agro waste	85.0	15.0	60.0



SPECIFICATION

CIVIL UNITS

S.No	DESCRIPTION
1a	DISSOLUTION TANK
1b	DRY WELL
2.	BIMA DIGESTER
3.	BUFFER TANK
4.	PRESS WATER STORAGE TANK
5.	CONDITIONING TANK

MECHANICAL UNITS

S.No	DESCRIPTION
A	SUBMERSIBLE MIXER
B	MACERATOR
C	DIGESTER FEED PUMP
D	VIBRATION FILTER FEED PUMP
E	GAS HOLDER
F	BLOWER
G	BIOLOGICAL H ₂ S SCRUBBER
H	GAS ENGINE
I	FLARE (LOCATED ABOVE BIMA)
J	VIBRATION FILTER PRESS
K	PRESS WATER TRANSFER PUMP

FLOW SHEET
 Heating arrangement by AKEL
 as per contract

CIVIL UNITS IN SOLID WASTE PLANT

Sl	Unit	No.	Size
01	Dissolution tank	2	4 X 4 X 2.5m LD (40m ³ each)
02	Dry well	1	5 X 5 X 6.56m ht.
03	Anaerobic digester	1	15m dia. X 15.06m ht.
04	Buffer tank	1	8 X 4 X 2.5m LD (80 m ³)
05	Dewatering station	1	7 X 4 X 7.5m LD (50 m ³)

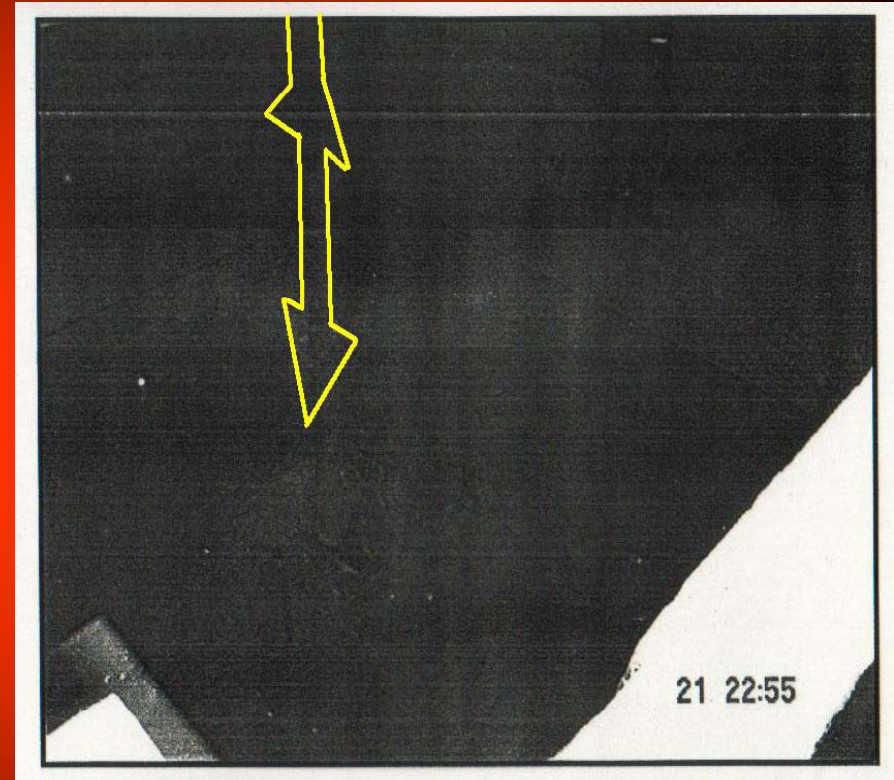
MECHANICAL EQUIPMENT

Sl	Equipment	No.	Capacity
01	Mixer	2	To suit the dissolution tank#
02	Macerator	1	30 m ³ / hr
03	Digester feed pumps	2	30 m ³ / hr@ 20m head
04	BIMA Digester internal parts	1	To suit digester size
05	Vibration filter press feed pumps	2	To suit digester size
06	Vibration filter press	1	5 tons / hr
07	Dry type gas holder	1	500 m ³
08	Protective silo	1	To suit gas holder
09	Blower	2	150 m ³ / hr

FEED PREPARATION

22 Nos. dissolution tanks each with 40m³ capacity are used as waste collection cum feed preparation tanks

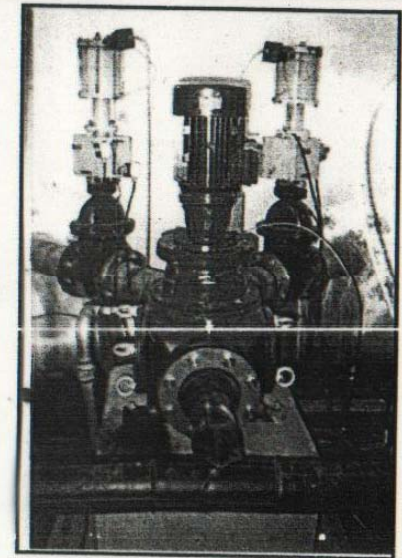
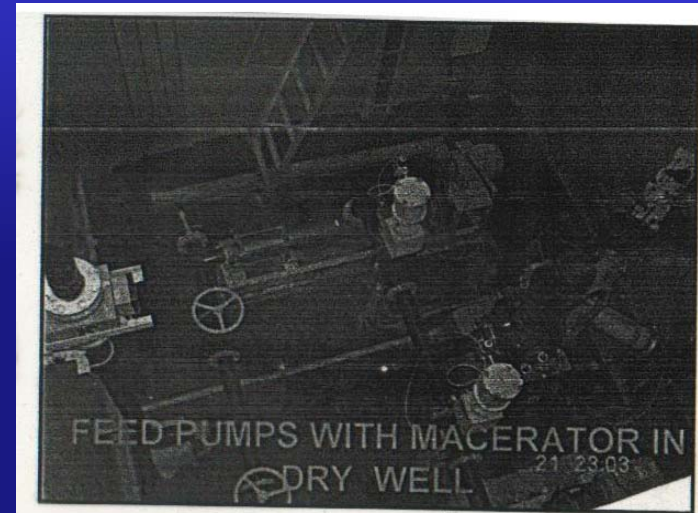
2 Agitators are provided in each tank to maintain uniform solid conc.



DISSOLUTION TANK

MACERATION AND FEEDING

- Feed solution is pumped into the high rate digester through macerator with the help of screw pumps
- Macerator is provided to reduce the particle size of the feed to less than 10mm
- An electromagnetic flow meter is provided on the delivery side of the pump to monitor the feed quantity
- The relevant parameters of the feed is analysed regularly
- The feed to the digester is controlled through PLC and the entire process is automatic



VIEW OF THE MACERATOR

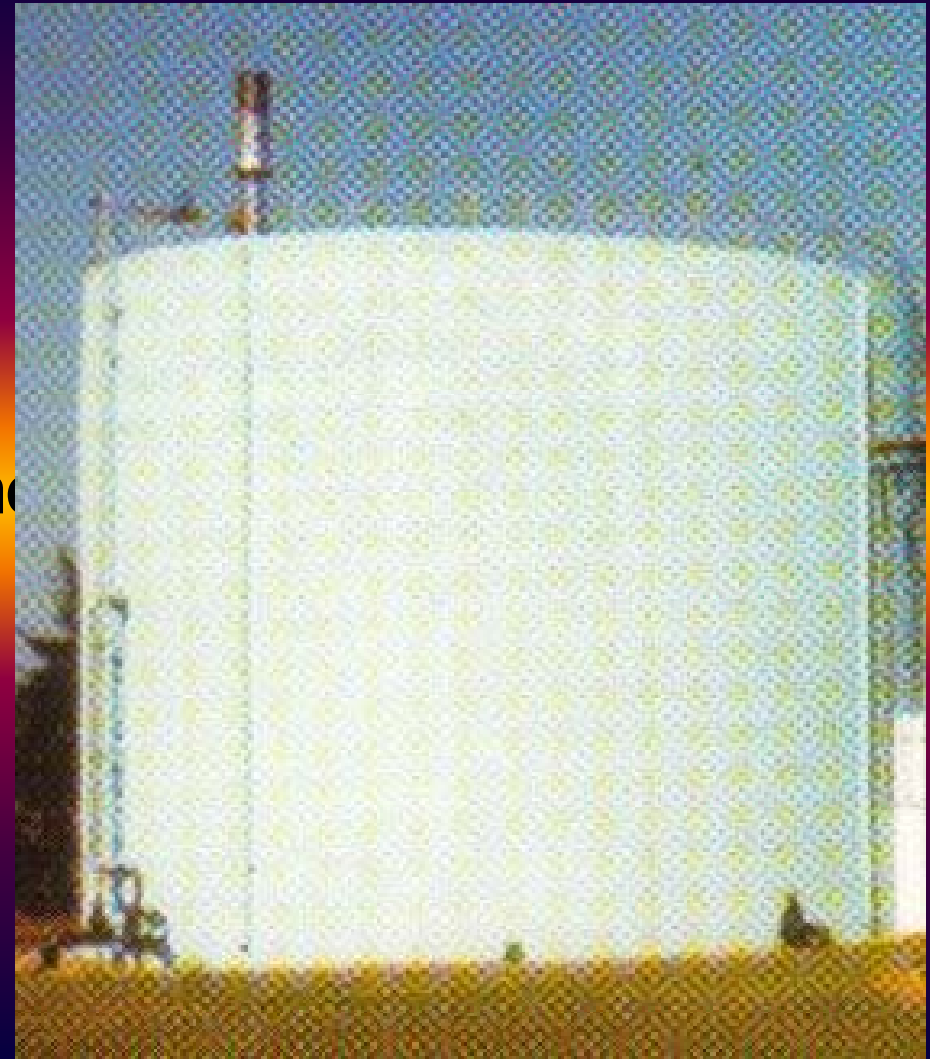
HIGH RATE BIOMETHANATION

| High rate BIMA digester is used for processing the solid wastes

| This BIMA digester is designed and developed by ENTEC.

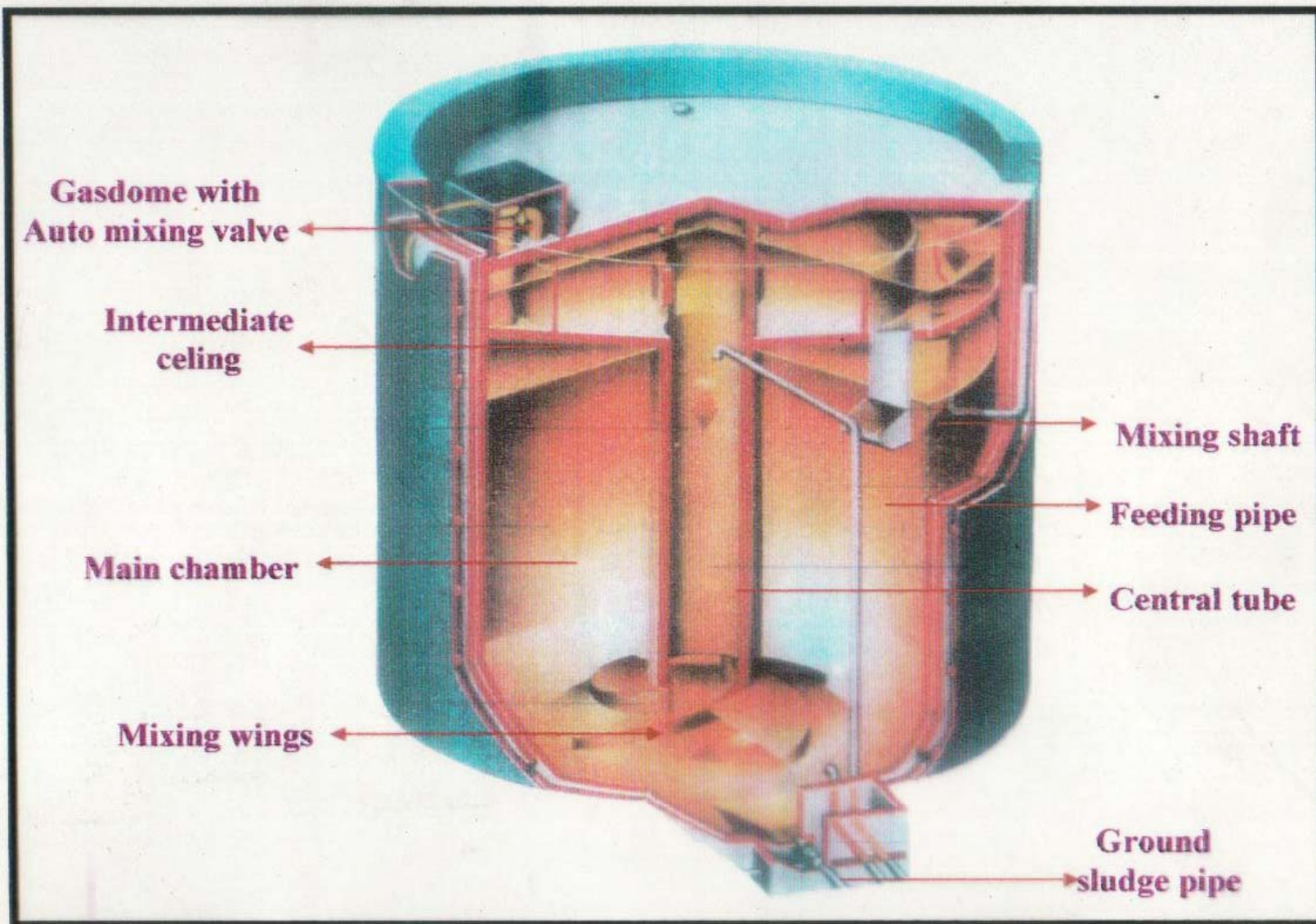
| Entire operation in the digester like the mixing arrangement is automatic & controlled by PLC

| Sample ports are provided in the digester to monitor the pH and analyse the solids concentration inside the digester

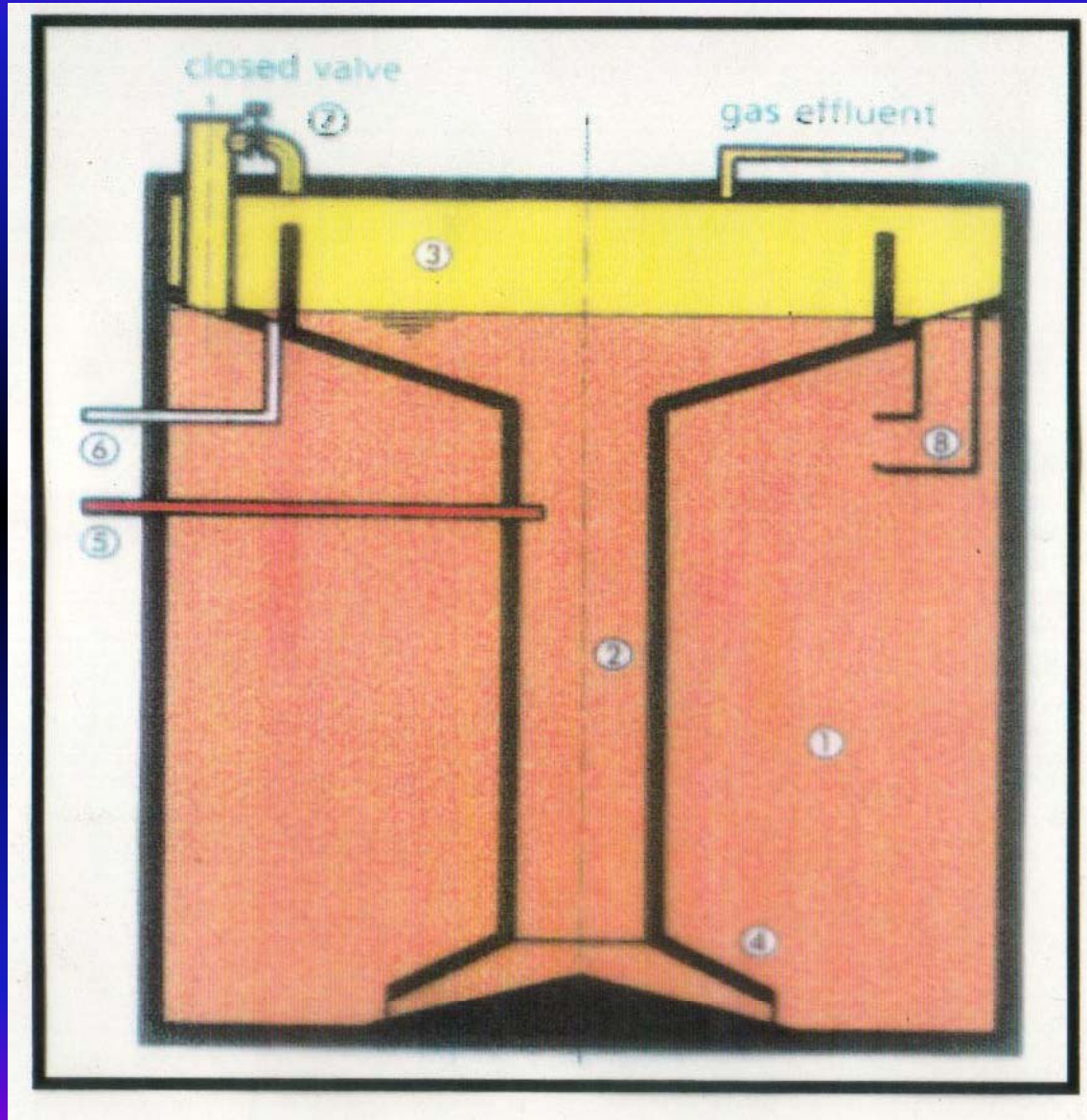


HIGH RATE BIMA DIGESTER

BIMA - Digester



SECTION OF BIMA DIGESTER



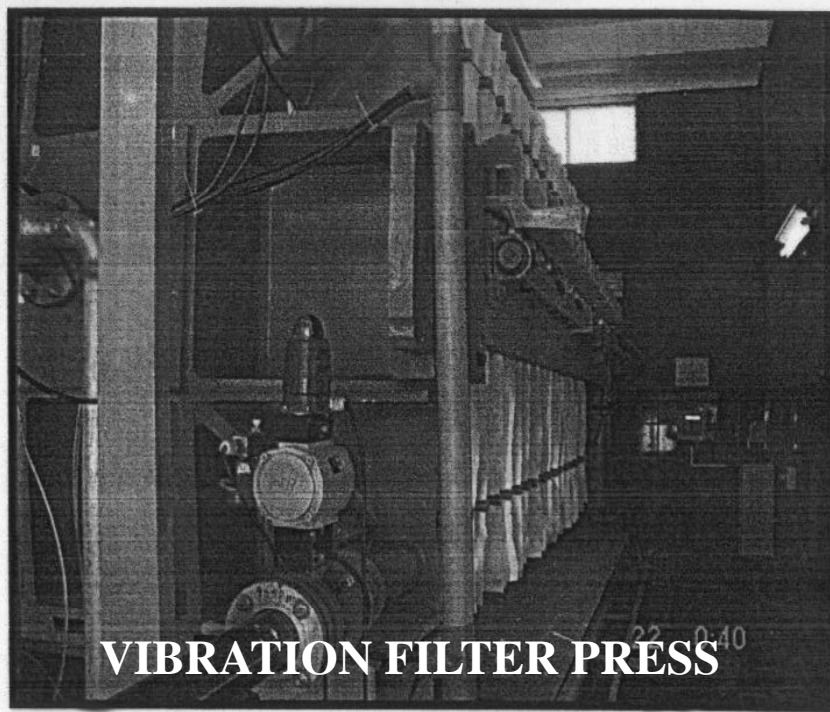
DEWATERING

-Overflow from the BIMA digester is taken to a buffer tank

-Overflow material is then transferred to vibration filter press for dewatering

-Centrate produced is taken back to the effluent treatment plant

-Dewatered cake is converted to bio manure and sold.



VIBRATION FILTER PRESS

BIOGAS STORAGE



DRY TYPE GAS HOLDER

- Biogas generated is stored in a dry type gas holder consisting of a balloon enclosed in a protection silo
- Gas holder has limit switches which indicate the biogas level
- Biogas is utilised in boiler
- in case the gas holder is full, flare is automatically triggered to burn the biogas.

PARAMETERS MONITORED

Regularly

Quantity of feed

6 Total Solids

6 Volatile Solids

6 Volume of Bio-gas produced

6 pH & Temp. in the digester

6 Gas levels in the gas holder

6 Mixing pressure inside the digester

6 Solids conc. In various levels of the digester

Periodically

Analysis of Gas

(a) VFA

(b) Alkalinity

OPERATING DATA

Sl	Waste characteristics as per design	During Operation
01	Average TS = 12.91%	TS = 8-12%
02	Average VS = 73.94%	VS = 70-85%
03	Total VS = 5.73 Tons	VS = 3-6 Tons
04	Gas yield = 2600m ³ /day \pm 5% 0.45 m ³ /kg VS fed	Gas produced 1800-2200m ³ /day 0.56 m ³ /kg of VS fed

Operating Data during One Year Performance Guarantee Period – VS Fed, Biogas Generated and Biogas Yield

	Total VS fed (kg)	Total Biogas Generated (m ³)	Biogas Yield (m ³ /kg VS fed)	
			Actual Value	Guaranteed Value
Mar 2002	102280	56598	0.55	0.45
Apr 2002	74183	25063	0.34	0.45
May 2002	66485	40557	0.61	0.45
June 2002	93213	55491	0.60	0.45
July 2002	124474	68312	0.55	0.45
Aug 2002	101169	47839	0.47	0.45
Sept 2002	66968	47727	0.71	0.45
Oct 2002	66902	46375	0.69	0.45
Nov 2002	49454	35664	0.72	0.45
Dec 2002	58606	30397	0.52	0.45
Jan 2003	133205	66238	0.50	0.45
Feb 2003	94063	52312	0.56	0.45
Mar 2003	98136	49896	0.51	0.45
Apr 2003	80563	38924	0.48	0.45

thank you