ANNEXURES

to the

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR

EXPANSION OF BULK DRUGS MANUFACTURING FACILITY FOR CHANGE IN PRODUCTION CAPACITY FROM 4800 TPA TO 9156 TPA

AT

R. S Nos. 30, 32, 33, 34, 35, 36 etc.

VILLAGE: PERIYAKALAPET, MATHUR ROAD
TEHSIL: PUDUCHERRY
STATE: PUDUCHERRY

BY:

M/s. Strides Shasun Limited

Strides Shasun

Project termed under schedule 5(f): Category 'A' Synthetic Organic Chemicals, ToR *vide* file no. J-11011/211/20l7-1A. II (I), dated: 16th August, 2017.

Report Prepared by:

HECS

(NABET Accredited vide Certificate No. NABET/EIA/1618/SA0015 &
MoEF Recognized Lab vide F. No. Q-15018/29/2007-CPW)
HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI

DECEMBER, 2017

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J-11011/211/2017-IA-II (I)
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi - 3
Dated: 16th August, 2017

To,

M/s Strides Shasun Limited
R S No. 33 & 34, Mathur Road, Periyakalapet
Puducherry -14

Sub: Expansion of Bulk Drugs manufacturing unit in Puducherry by M/s Nebula Health Care - Terms of Reference - reg.

Ref: Online Application No. IA/PY/IND2/64233/2017 dated 23rd May, 2017

Sir,

This is in reference to your proposal No. IA/PY/IND2/64233/2017 dated 23rd May, 2017 along with project documents namely Form-I, Pre-feasibility Report and draft 'Terms of Reference'. It is noted that the proposal is for grant of ToR for expansion of Bulk Drugs manufacturing facility for capacity from 4800 TPA to 9156 TPA in an area of 24.99 acres at R.S No. 30 / 4 PT, 32 / 1A, 32 / 2, 32 / 3,33 / 1, 33 / 10, 33 / 11, 33 / 13, 33 / 2, 33 / 3, 33 / 4, 33 / 5, 33 / 6, 33 / 9, 34 / 1, 34 / 2, 34 / 3, 34 / 4, 34 / 5, 34 / 6, 34 / 7, 34 / 8, 35 / 4, 35 / 5, 35 / 6, 35 / 7, 36 / 5 Periakalapet, Mathur Road, Puducherry of M/s Strides Shasun Limited.

2. It is reported that no additional land will be utilised for the expansion. Industry has already developed greenbelt in an area of 30.6% i.e., 7.65 acres out of 24.99 acres of the project area and will be developing 0.97 acres after expansion, making total greenbelt area to 8.62 acres (34.5%). Total Employment will be 850 persons as direct and 900 persons as indirect.

3. Following is the list of existing and proposed products:

Existing			After Change in product mix		
S.No	**Product Name**	**Quantity TPA**	**S.No**	**Product Name**	**Quantity TPA**
1.	Ibuprofen	4308	1.	Ibuprofen	7200
2.	Ibuprofen DC	240	2.	Ibuprofen DC	1200
3.	Ibuprofen Lysinate, Ibuprofen Sodium & S+ Ibuprofen	240	3.	Ibuprofen Lysine Ibuprofen Sodium & S+ Ibuprofen	540
4.	Carisoprodol	12	4.	Carisoprodol	12
5.	Pilot Scale Operations for R&D	-	5.	Pilot Scale Operations for R&D	-
			6.	Pilot Plant Small Scale Volume Products	12
6.			7.	Pregabalin	180
7.			8.	Sapropetrin	12
Total		**4800**	**Total**		**9156**

4. The estimated project cost is Rs.125 crore including existing investment. Total funds earmarked towards environmental pollution control measures are Rs.52.25 crores and the Recurring cost (operation and maintenance) will be about Rs.1.90 crores per annum.

5. As per Form-1, it is reported that no National Parks, Wildlife Sanctuaries, Biosphere Resources, Tiger/ Elephant Reserves, Wild Life Corridors etc. lies within 10 km radius from the site. Bay of Bengal Sea is at a distance of 1.72 km in East direction.

6. Draft Terms of Reference were discussed and finalized during 24th Expert Appraisal Committee (Industry-2) meeting held during 14-16 June, 2017. The Committee recommended the standard ToR applicable for such projects (refer Ministry's website) for preparation of EIA/EMP report, along with the additional ToR as under:-

(i) Public Consultation shall be done as per provisions of the EIA Notification, 2006.
(ii) Layout Plan for 10 m wide green belt around periphery of the plant to be submitted.
(iii) ZLD Plan to be submitted.
(iv) Chrolology w.r.t. production since its establishment.
(v) Copy of permission from CGWB for groundwater withdrawal to be submitted.
(vi) List of scrubbers installed and proposed w.r.t. process emissions.
(vii) Toxicity study for each chemical in local environment.
(viii) Certified compliance report for existing EC, if any, to be obtained from RO, MoEF&CC.
(ix) Copy of valid consent to operate for the existing unit.
(x) Authenticated Map with clear-cut demarcation of CRZ.

7. Based on the recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords the terms of reference for preparation of EIA/EMP reports for the above said project, with the standard ToR applicable for such projects and the additional ToR as specified above.

8. You are requested to submit the final EIA/EMP reports as per the ToR, prepared through the consultants accredited with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET), to the Ministry for considering the proposal for environmental clearance within 3 years as per the MoEF O.M. No. J-11013/41/2006-IA.II (I) dated 8th October, 2014.

16/8/2017

(S. K. Srivastava)
Scientist E

Copy to:

1. The Member Secretary, Puducherry Pollution Control Committee, No. 1, Panni Thittu Main Road, Moopanar Thottam, Vambapet, Bahour Commune, Puducherry - 607 402
2. Guard File/ Monitoring File/ Website/ Record File

COMPLIANCE TO TERMS OF REFERENCE

S.No	Terms of Reference	Compliance
A.	**Standard TOR**	
1	**Executive Summary**	Brief executive summary is given Page ii.
2	**Introduction**	
	i. Details of the EIA Consultant including NABET accreditation	M/s Hubert Enviro Care Systems (P) Ltd., Chennai (NABET Accredited vide Certificate No. NABET/EIA/1618/SA0015 & MoEF Recognized Lab vide F. No. Q-15018/29/2007-CPW) Refer to **Chapter 11, Section 11**
	ii. Information about the Project Proponent	M/s. Strides Shasun Limited Periyakalapet was established in the year 1986 and is headquartered in Bangalore. The proposed project is Expansion of Bulk Drug Unit with change in capacity from existing 4800 TPA with 5 products to 9156 TPA with 8 products. Details given in **Chapter 1, Section 1.2**
	iii. Importance and Benefits of the Project	The Proposed project is playing a vital role in the health care protection and thereby addresses the market demand for new generation drugs and offers Social benefits. Details given in **Chapter 1, Section 1.4**
3	**Project Description**	
	i. Cost of project and Time of completion	Project cost is Rs. 125 Crores Details given in **Chapter 2, Section 2.3**
	ii. Products with capacities for the proposed project	Change in product mix Proposed – 8 products (9156 TPA) Expansion of bulk drug unit with change in product mix

<table>
<tr><th>S.No</th><th>Terms of Reference</th><th>Compliance</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Sl. No.</th><th>Status of product</th><th>Quantity (TPA)</th><th>Number of Products</th></tr>
<tr><td>1</td><td>Existing</td><td>4800</td><td>5</td></tr>
<tr><td>2</td><td>Retained</td><td>4800</td><td rowspan="2">5</td></tr>
<tr><td>3</td><td>Increase within Retained</td><td>4152</td></tr>
<tr><td>4</td><td>Additional</td><td>204</td><td>3</td></tr>
<tr><td>5</td><td>Total after expansion</td><td>9156</td><td>8</td></tr>
</table>
Details provided in Table 2.4 & Annexure 26
</td></tr>
<tr><td></td><td>iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.</td><td>Existing - 5 products. (4800 TPA)
The total site area is 25.99 acres where the expansion is proposed within the existing premises. Adequate facilities are available in the existing plant.
Details provided in Table 5</td></tr>
<tr><td></td><td>iv. List of Raw materials and their source with mode of transportation</td><td>The list of raw materials are given Chapter 2, Section 2.5, appended as Annexure 25.
The Raw materials are sourced from domestic as well as international markets.
Mode of transportation: Road & Sea ways & Air ways</td></tr>
<tr><td></td><td>v. Other chemicals and materials required with quantities and storage capacities</td><td>Other than raw materials, solvents such as Acetone, Hexane, IPA, Toluene and Methanol will be used in the process.
Details of solvents and its storage capacity of each tank is given in Table no 2-6</td></tr>
<tr><td></td><td>vi. Details of emission, effluents, hazardous waste generation and their management</td><td>Emission sources are Boiler, DG, scrubber & reactor
Detailed in Table 2.13
Hazardous waste will be sent to authorized TSDF. Hazardous waste generation &</td></tr>
</table>

S.No	Terms of Reference	Compliance
		management is detailed in **Table no. 2-15** The proposed expansion facility will generate 45 KLD domestic sewage and 550 KLD effluents from industrial operations/processes. The sewage generated will be treated in STP (Combined ETP). High pollutant stream is treated in stripper and MEE. The condensate and treated STP sewage water is sent to biological treatment followed by RO Plant for using in Process/ Non Process area. The effluents will be treated in Combined Effluent Treatment Plant (ZLD system, commissioned in September 2017). The same has been installed & commissioned on 31.03.2017. Approval has been sought from PPCC for ATFD salts disposal to TSDF (Refer Application details to be attached as Annexure 27). The marine outfall has been discontinued in October 2017. Current treatment plant capacity is sufficient to treat increased effluent quantity. Effluent generated will be treated in ZLD system. Detailed under **Section 2.6.**
	vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	The total water requirement after proposed expansion is 2315 KLD. Freshwater of 498 KLD will be sourced from in-house bore wells/ externally procured treated sewage, PIMS, MGMC, PWD, desalinated sea water etc. Water requirement, source of supply & Water balance diagram detailed in **Chapter 2, section 2.5.3, 2.6.4 & Annexure 9 respectively** Power requirement after expansion will be 5860 KVA from Puducherry EB and 6 DG sets(3 x 1500 KVA + 3 x 1000 KVA) will act as backup. Power requirement detailed in **Section 2.5.4** About Manpower requirement detailed in **Section 2.5.5**

S.No	Terms of Reference	Compliance
	viii. Process description along with major equipments and machineries, process flow sheet (quantitative) from raw material to products to be provided	Process flow diagram (overall) given in **Fig. 2-6** and individual product wise process description **Annexure 7.** Major equipment & machineries details given in **Section 2.7** List of Raw Materials is given as **Table 2-5**
	ix. Hazard identification and details of proposed safety systems	This is a Pharmaceutical Ingredients manufacturing process and solvents will be used in the process. A separate storage facility is provided for the storage of solvents and Raw materials. Hazard identification and safety system detailed in Onsite Emergency Plan **Annexure 14** and Risk Assessment **Annexure 15**
	x. Expansion/ modernization proposals (a) Copy of all Environmental Clearance(s) including amendments there to obtaining for the project from MoEF & CC/SEIAA shall be attached as an Annexure. A certified copy of the latest monitoring report of the Regional office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all existing environmental clearances including Amendments shall be provided. In addition status of compliance of Consent to	a) The industry has been established in 1986. There is no existing EC. Existing CTE & CTO is enclosed as **Annexure 3.** EC/CTO Compliance Report is enclosed within PCB Compliance Report is enclosed as **Annexure 24.**

S.No	Terms of Reference	Compliance
	Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report (b) In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA notification 1994 and/or EIA notification 2006 shall be provided. Copies of Consent to Establish / No objection certificate and Consent to Operate (in case of units operating in prior to EIA notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further compliance report to the conditions of Consents from the SPCB shall be submitted. (c) Comparative statement of existing and the proposed capacity, products, use of natural resources, waste generation, pollution potential, etc.,	b) CTE and CTO for the unit is attached as **Annexure 3** The industry has been established in 1986. There is no existing EC. Upto 2009, 3 products with 1860 TPA were produced and from 2009, product mix was changed into 5 nos of products at 4800 TPA. c) Detailed in **Chapter 2**
4	Site Details	
	i. Location of the project site covering village, Taluka/Tehsil, District and State, justification for selecting the site. Whether other sites were	M/s. Strides Shasun Limited Plot no. R.S Nos. 30/4 PT, 32/1A, 32/2, 32/3, 33/1, 33/10, 33/11, 33/13, 33/2, 33/3, 33/4, 33/5, 33/6, 33/9, 34/1, 34/2, 34/3, 34/4, 34/5, 34/6,

S.No	Terms of Reference	Compliance
	considered	34/7, 34/8, 35/4, 35/5, 35/6, 35/7, 36/5, Periakalapet, Mathur Road, Puducherry Union Territory. Alternate site were not considered due to location and facilities at the premises of the existing facility. Details given in **Chapter 1, Section 1.5.1**
	ii. A Topo sheet of the study area of radius of 10Km and site location on 1:50,000/ 1:25,000 scale on an A3/A2 sheet (including al eco-sensitive areas and environmentally sensitive places)	Topomap of the study area of 10 km radius appended in **Fig 3.2.** Detailed in **Chapter 3, Table 3-1**
	iii. Details w.r.t option analysis for selection of site	Alternate site were not considered due to location and facilities at the premises of the existing facility. Details given in **Chapter 1, Section 1.5.1**
	iv. Co-ordinates (lat-long) of all four corners of the site	Details given in **Chapter 2, Section 2.1**
	v. Google map Earth downloaded of the project site	Google satellite image appended in **Fig 2.1 – 2.3**
	vi. Layout maps including existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an industrial area/Estate/Complex, layout of Industrial indicating location of unit within the Industrial area/Estate.	Proposed layout provided in **Annexure 5** (Expansion to come up in existing plant premises)
	vii. Photographs of the proposed and existing (if applicable) plant site, existing, show photographs of plantations/greenbelt, in particular	Site photographs are appended in **Fig no. 2.5**

<table>
<tr><th>S.No</th><th>Terms of Reference</th><th>Compliance</th></tr>
<tr><td></td><td>viii. Land use break-up of total land of the project site (indicate and acquired), government/ private-agriculture, forest, wasteland, water bodies, settlements, etc shall be included (not required for industrial area)</td><td>
<table>
<tr><th rowspan="2">Sl. No.</th><th rowspan="2">Description</th><th>Existing</th><th>Proposed</th><th>Total Area (After Expansion)</th><th rowspan="2">Area (%)</th></tr>
<tr><th>Area in (Acres)</th><th>Area in (Acres)</th><th>Area in (Acres)</th></tr>
<tr><td>1</td><td>Green Belt</td><td>7.39</td><td>1.80</td><td>9.19</td><td>35.37%</td></tr>
<tr><td>2</td><td>Roads & Other Area</td><td>12.78</td><td>-2.26</td><td>10.52</td><td>40.47%</td></tr>
<tr><td>3</td><td>Build up Area</td><td>5.82</td><td>0.46</td><td>6.28</td><td>24.16%</td></tr>
<tr><td colspan="2">Total Land Area</td><td>25.99</td><td>0.00</td><td>25.99</td><td>100.0%</td></tr>
</table>
The detailed land use breakup of the industry is as given in Chapter 2, Section 2.5.2
</td></tr>
<tr><td></td><td>ix. A list of major industries with name and type within the study area (10 km radius) shall be incorporated. Land use details of the study area)</td><td>List of industries within 10 km radius is given in Table 2-3
Land use details of the study area details given in Chapter 3, Section 3.5.4</td></tr>
<tr><td></td><td>x. Geological features and Geo-hydrological status of the study area shall be included.</td><td>Geological features & Geo-hydrology status of the study area details given in Chapter 3, Section 3.5.6- 3.5.8</td></tr>
<tr><td></td><td>xi. Details of drainage of the project up to 5km radius of the study area. If the site is within 1Km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years.</td><td>Detailed in Chapter 3, Section 3.5</td></tr>
</table>

S.No	Terms of Reference	Compliance
	Details of Flood Level of the project site and maximum of Flood of the river shall also be provided (mega green field projects)	
	xii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete procession of the land.	Land documents for possession of land by M/s. Strides Shasun Ltd. is attached as **Annexure 4**
	xiii. R&R details in respect of land in line with state Government policy	Not applicable. Land is in possession of M/s. Strides Shasun Ltd.
5	Forest and wildlife related issues (if applicable)	
	i. Permission and approvals for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department (if applicable)	Not Applicable
	ii. Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forest land (in case of projects involving forest land more than 40 Ha)	Land use map based on High resolution satellite imagery (GPS) details given in **Fig 3.5**
	iii. Status of application submitted for obtaining the stage I Forestry Clearance along with latest status shall be submitted	Not Applicable
	iv. The projects to be located within 10 Km of the National parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the	Not Applicable. • Ousteri Wetland & National Park_13.7 Km_SW • Kaliveli Lake _8.1 Km_N • Botanical Garden, Puducherry_12.6 Km_S

S.No	Terms of Reference	Compliance
	map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.	
	v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of schedule I fauna, if any exists in the study area.	Not Applicable
	vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972 to the Standing Committee of the National Board for Wildlife.	Not Applicable
6	Environmental Status	
	i. Determination of atmospheric inversion level at the project site and site-specific micrometeorological date using temperature, relative humidity, hourly wind speed and direction and rainfall	Details given in **Chapter 3, Section 3.6.4.1**
	ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based on CPCB guidelines and take into account the pre-dominant wind direction, population zone, sensitive receptors including	Data was collected for 8 different locations from July to Sept 2017. The results are found within the NAAQS limits. Detailed in **Table 3.8 and Fig. 3.18**

S.No	Terms of Reference	Compliance
	reserved forests.	
	iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM notification of Nov. 2009 along with-min-max, average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA report	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency has been provided in Chapter 3 of EIA Report. The results are found within the NAAQS limits. Detailed in **Table 3.8 – 3.17**
	iv. Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/ MoEF&CC guidelines.	Samples collected from 8 different locations and analyzed the results are within the standard limits. Results given in **Table 3-12**
	v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF& CC, if yes give details	No
	vi. Groundwater monitoring at minimum 8 locations shall be included	Samples were collected from 8 different locations within 10 km radius and analysis results are given at **Table 3-15** Quality of ground water was found within the IS Drinking water standard limits.
	vii. Noise level monitoring at minimum 8 locations within the study area	Noise level measurements from 8 different locations within 10 km radius are recorded. The results are found within the Noise standard limits. Results given in **Table 3-9**
	viii. Soil characteristics as per CPCB guidelines	Soil samples were collected from 8 different locations and analyzed. The predominant soil

S.No	Terms of Reference	Compliance
		texture is found as red soil. Results given in **Table 3-17**
	ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.	The proposed site falls within the existing premises of Shasun facility and the traffic due to the proposed project is marginal as it is only expansion within existing premises. The company provides adequate parking within its premises for employees/visitors.
	x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If schedule-I fauna and found within the study area, a Wildlife Conservation plan shall be prepared and furnished	There is no endemic and endangered species found within the study area. Detail study of Flora & Fauna in **Chapter 3, Section 3.10**
	xi. Socio-economic status of the study area	Details given in **Chapter 3, Section 3.11**
7	Impact and Environmental Management Plan	
	i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, AQIP modeling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the	The ground level concentration of pollutants (PM, SO_2, NO_2) using AERMOD software were assessed and presented in **Chapter 4, Section 4.3** The prediction values were found within NAAQ limits.

S.No	Terms of Reference	Compliance
	AAQ of the area shall be assessed. ii. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall be plotted on a location map showing the location of the project site, habitation nearby, sensitive receptors, if any.	
	iii. Water quality modeling- in case of discharge in water body	Not Applicable. Effluent will be treated in ETP.
	iv. Impact of the transport of raw material and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.	Transport of raw materials and finished products and wastes through road, sea & Air ways based on material requirements
	v. A note on treatment of waste water from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment, characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) rules.	The proposed expansion facility will generate 45 KLD sewage from domestic activities and 458 KLD effluents from industrial operations/processes. The sewage generated will be treated in STP (Combined effluent treatment plant). High pollutant stream is treated in Stripper and MEE. The condensate is sent to Biological treatment followed by RO plant for using in Process/Non process area. Water Requirement: <u>Existing</u> Total water requirement – 1116 KLD

S.No	Terms of Reference	Compliance
		Fresh water Requirement – 110 KLD Recycled water – 1051 KLD <u>Proposed</u> Fresh water Requirement – 433 KLD Recycled water – 766 KLD Total water requirement – 1199 KLD. Source: Freshwater from in-house borewells, Recycled water from process/ treated sewage from PIMS and PWD etc. Details given in **Chapter 2, Section 2.5.3**
	vi. Details of stack emission and action plan for control of emissions to meet standards.	Detailed in **Chapter 4, Section 4.3.1.5**
	vii. Measures for fugitive emission control	Fugitive emission: Materials will be handled through closed conveyance and suction system. Leak detection system will be in place for effective monitoring and control. Detailed provided in **Chapter 4, Section 4.3.1.7**
	viii. Details of hazardous waste generation and their storage, utilization and management, Copies of MOU regarding utilization of solid and hazardous waste in cement plant also be included. EMP shall include the concept of waste-minimization, recycle/ reuse/recover techniques, Energy conservation, and natural resource conservation.	This is a Pharmaceutical Ingredients manufacturing process and solvents will be used in the process. A separate storage facility is provided for the storage of solvents and Raw materials. Hazardous waste generation & management detailed in **Section 2.6.5** Agreement made with Authorized vendors/TSDF for safe disposal of hazardous wastes, enclosed as **Annexure 23.** Necessary energy saving measures like LED lamps, operational schedule, awareness

S.No	Terms of Reference	Compliance
		program etc.,
	ix. Proper utilization of fly ash shall be ensured as per Fly Ash notification, 2000. A detailed plan of action shall be provided.	90 TPD bio-briquettes is used for boiler generating 4 TPD total ash being disposed to local farmers for agricultural purpose.
	x. Acton plan for the green belt development plan in 33% area i.e., land with not less than 1500 trees per Ha. Giving details of Species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.	Existing Green belt is 7.39 Acres (28.45 %) of 24.99 Acres, proposed is 9.19 Acres (35.37%) of 25.99 Acres. Green belt development plan detailed in **Chapter 9, Section 9.5.7** & Green belt layout enclosed as **Annexure 6.**
	xi. Action plan for rain water harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reuse the water requirement from other sources.	In existing plant already rain water harvesting facility is available.
	xii. Total capital cost and recurring cost /annum for environmental pollution control measures shall be included.	Total capital cost for environmental pollution control measures is Rs. 52.25 Crores and recurring cost Rs.1.90 crores Details provided in **Table 9-9.**
	xiii. Action plan for Post-project environmental monitoring shall be submitted	Post-project environmental monitoring plan for Meteorology, AAQ, Noise, Liquid effluent, emission from DG sets, Vehicular emission,

S.No	Terms of Reference	Compliance
		Solid and Hazardous wastes, soil and terrestrial ecology, is explained in **Table 6-1.**
	xiv. Onsite and offsite Disaster (natural and Man-made) preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster Management Plan should be linked with District Disaster Management Plan.	The On-site emergency Plan is attached as **Annexure – 14.**
8	Occupational Health	
	i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	A budget provision of Rs. 2.88 Crores for occupational health & safety is planned. Details provided in **Chapter 9, Section 9.7.1**
	ii. Details of exposure specific health status evaluation of worker. If the worker's health is being evaluated by pre-designed format, chest x-rays, Audiometry, Spirometry, Vision testing (Far and near vision, colour vision and any other ocular defect), ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.	Details provided in **Chapter 9, Section 9.6.5** Medical reports of employees given as **Annexure 16.**
	iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are Permissible	The company has provided good engineering control systems like scrubber systems, dust collectors, air handling units etc to keep the work environment within PEL and also provided

S.No	Terms of Reference	Compliance
	Exposure level (PEL) if these are not within PEL, what measures the company has adopted to keep them within PEL. So that health of the workers can be preserved.	NIOSH approved PPEs to the workers to protect the health of the workers.
	iv. Annual report of health status of workers with special reference to Occupational Health and Safety	Same as above point.
9	Corporate Environment Policy	
	i. Does the company have a well laid down Environmental Policy approved by its Board of Directors? If so, it may be detailed in the EIA report	Yes. Environmental Policy is appended in **Fig 9-2**
	ii. Does the Environment Policy prescribe for standard operating process/procedures to bring into focus any infringement/ deviation/ violation of the environemnt or forest norms/ conditions? If so, it may be detailed in the EIA	Yes. Environmental Policy is appended in **Fig 9-2**
	iii. What is the hierarchical system or Administrative order of the company to deal with the environemntsl issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.	Yes, Hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance is provided in **Chapter 9, Section 9.3**
	iv. Does the company have system of reporting of non-compliances/ violations of environemntal norms	Yes, reporting mechanism provided in **Chapter 9, Section 9.3**

S.No	Terms of Reference	Compliance
	to the Board of Directors of the company and/or Stakeholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	
10	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	▪ Separate rest room and waiting room facility is provided for drivers, visitors etc., ▪ Adequate change room and rest room facility for both men and women.
11	Enterprise Social Commitment (ESC)	
	i. Adequate funds (at least 2.5% of the project cost) shall be earmarked towards the Enterprise Social Commitment based on public Hearing issues and item-wise details along with the bound action plan shall be included. Socio-Economic development activities need to be elaborated upon.	Adequate funds will be earmarked towards the Enterprise Social Commitment. Detailed in **Chapter 9, Section 9.10**
12	Any litigation pending against the project and/ or any direction/ order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance /ATR to the notice(s) and present status of the case.	No

S.No	Terms of Reference	Compliance
13	A tabular chart with index for point wise compliance of above TOR	Complied
B.	Specific Terms of Reference for EIA studies for Synthetic Organic Chemicals Industry (Dyes & Dye Intermediates; Bulk Drugs and Intermediates Excluding Drug Formulations; Synthetic Rubbers; Basic Organic Chemicals, Other Synthetic Organic Chemical and Chemical Intermediates)	
1	Details on solvents to be used, measures for solvent recovery and for emissions control.	Solvent recovery Solvents such as Acetone, Hexane, IPA, Toluene and Methanol will be used in the process which will be recovered and reused within the process stages. Emission Control The major source of emission is from Boiler, reactor stacks & DG stack. Regular monitoring of DG-Stack and Ambient air quality will be carried out. Except DG stacks all the other stacks are connected to online monitoring system. Details are given in Chapter No. 4 Table no & Chapter 9, Table 9.4
2	Details of process emissions from the proposed unit and its arrangement to control	Process emissions (Acid fumes & VOC) will be controlled by wet scrubbers & bag filters Control measures are detailed in **Table 4-7**
3	Ambient air quality data should include VOC, other process specific pollutants* like NH3*, Chlorine*, HCl*, HBr*, H2S*, HF*, etc., (*-as applicable)	Data was collected for 8 different locations from July 2017 to September 2017. The results are found within the NAAQS limits. Detailed in **Table 3-8 and Fig 3-17**
4	Work zone monitoring arrangements for hazardous chemicals	▪ Strides Shasun is having multi gas detectors which can be used to check Oxygen, LEL, VOC, CO and H_2S concentration in

S.No	Terms of Reference	Compliance
		atmosphere and also in confined spaces like inside the reactor, overhead tanks, underground tanks, sump etc .
5	Detailed effluent treatment scheme including segregation of effluent streams for units adopting 'Zero 'Liquid discharge.	Zero Liquid Discharge (ZLD) system has been installed as per approval from PPCC and it is under operation. Current ZLD plant capacity is sufficient to treat increased effluent quantity due to proposed expansion. Detailed in **Chapter 2, Section 2.6.4** and scheme is enclosed as **Annexure 11**
6	Action Plan for odour control to be submitted	Suitable closed conveyance and Scrubber system is in place
7	A copy of the Memorandum of Understanding signed with cement manufacturers indicating clearly that they co-process organic solid/hazardous waste generated	The solid and hazardous waste shall be disposed to TSDF. Agreement made with Authorized vendors/TSDF for safe disposal of hazardous wastes, enclosed as **Annexure 23.**
8	Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any	Common Effluent Treatment Plant (CETP) – Not Applicable. The effluent generated will be treated & reused in the inhouse Combined Effluent Treatment Plant (ZLD), Detailed in **Chapter 2, Section 2.5.3 & 2.6.4** and scheme is enclosed as **Annexure 11** The solid and hazardous waste shall be disposed to PPCC approved vendors. Approved vendors agreement copy and PPCC approval letter in the Annexure 30
9	Action plan for utilization of MEE/dryers salts	Sludge from ATFD shall be disposed off to TSDF as hazardous waste.
10	Material safety data sheet for all the chemicals being used/will be used	MSDS attached as **Annexure 8**

S.No	Terms of Reference	Compliance
11	Authorization / Membership for the disposal of solid / hazardous waste in TSDF	The solid and hazardous waste shall be disposed to PPCC approved vendors. Approved vendors agreement copy and PPCC approval letter in the **Annexure 23.**
12	Details of incinerator if to be installed	The solid waste generated will be sent to the authorized hazardous waste management vendor. Hence no incinerator to be installed.
13	Risk assessment for storage and handling of hazardous chemicals/solvents. Action plan for handling & safety system to be incorporated	Detailed Risk Assessment Report is enclosed as **Annexure 15.**
14	Arrangements for ensuring health and safety of workers engaged in handling of toxic materials	All personnel shall be provided with personal Protective equipment's individually as required. Monitor the workplace to maintain industrial hygiene practices. People working in that area shall undergo annual health checkup Details in **Chapter 9, Section 9.6**
Additional TORs for EIA Studies		
1.	Public Consultation will be done as per provisions of the EIA Notification, 2006	Will be complied.
2..	Layout plan for 10m wide greenbelt around the periphery of the	Existing green area is 7.39 Acres (28.45 % or total land area 24.99 Acres). The proposed Green belt area is 1.80 Acres The total green belt area is 9.19 Acres (35.37 % of total land area 25.99 Acres). As this is expansion project within the existing premises. Land break details are given in Table 2.8 & greenbelt layout enclosed as **Annexure 6** To compensate areas where greenbelt is not 10m wide due to space constraint, the used

S.No	Terms of Reference	Compliance
		species will be dense thick bushy vegetation with dense foliage.
3.	ZLD system to be adopted	ZLD Detailed plan, Process & Layouts has been enclosed as **Annexure 10 and 11**
4.	Chronology w.r.t production since its establishment	M/s. Strides Shasun Limited has established on 1986, The chronology of the project w.r.t production. Details are given in Chapter 2, Section 2.2.
5.	Copy of permission from CGWB for groundwater withdrawal to be submitted.	Please refer **Annexure 19**.
6.	List of scrubbers installed and proposed w.r.t process emissions	Existing and proposed scrubbers list detailed in the Chapter No. 4 Table no 4.2
7.	Toxicity study for each chemical in local environment	Noted and will be complied
8.	Certified compliance report for existing EC, if any, to be obtained from RO, MoEF & CC	M/s. Strides Shasun Limited Puducherry has been established in 1986. No EC was issued.
9.	Copy of valid consent to operate for the existing unit	Enclosed as **Annexure 3**.
10.	Authenticated Map with clear-cut demarcation of CRZ	The project site does not fall within CRZ area, hence CRZ demarcation map is not required.

CTO-ZLD – AIR&water 5/4/17

STRIDES SHASUN LIMITED Puducherry 605 014 PERIYAKALAPET

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III FLOOR, PHB BUILDING, ANNA NAGAR, PUDUCHERRY – 5.
Phone: (0413) 2201256, Fax: (0413) 2203494

* * *

AIR CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/ 1699 Puducherry, the 31 MAR 2017

Consent is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and orders made there under to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry authorizing them to operate their **Zero Liquid Discharge plant with Multiple Effect Evaporator (250 KLD capacity) and new Briquette fired boiler (16 TPH capacity)** in the Air Pollution Control area as notified subject to the conditions mentioned below:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent is valid upto : 31.01.2018.

III. Manufacturing Products : Ibuprofen – 359 TPM,
Ibu profen Dc – 20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) – 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D.
Total – 400 TPM

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m

V. **Specific Conditions:**

1. Flue Gas from 16 TPH briquette fired boiler shall be controlled with adequate air pollution control devices Bag filters/Multi cyclone arrangement and let out through stack height of 30 m height or higher than the surrounding building, whichever is higher.

2. PM emissions from the above boiler shall not exceed 150 mg/Nm^3.

3. The existing 3 numbers of boilers (Capacity - 3.5 TPH x 1 No. and 4.5 TPH x 2 Nos.) shall be operated on standby basis.

4. The unit shall have proper arrangements for monitoring and control of odour from Multiple Effect Evaporator and Agitated Thin Film Evaporator plant.

5. The new 1500 KVA DG Set proposed for power back up of Boiler & MEE operation shall be operated during power failure only and shall have Type Approval Certificate issued by Agencies authorized by Central Pollution Control Board. It shall meet the noise and air emission standards prescribed under The Environment (Protection) Rules, 1986 and shall be provided with integral acoustic enclosure.

6. All other conditions stipulated in Air consent order (Renewal) dated 01.02.2017 remains valid until the removal and dismantling of marine discharge pipelines.

VI. General Conditions:

1. The application for renewal of consent shall be made at least 30 days before the date of expiry of this consent order.

2. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.

3. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to cancel, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.

4. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this committee.

VII. Better Environmental Management Practices:

1. Green Belt / Thematic garden with woody plant / herbal plants shall be developed.
2. Energy conservation measures like installation of LED's for lighting the areas inside and outside the building should be integral part of the design.
3. Used CFL's and TFL's should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid toxic contamination.
4. Use of solar panels may be adapted to the maximum extent possible, especially for street lights.
5. 5% of power requirement of the unit shall be met out from renewable energy sources within period of three years as per PPA Building Bye-Laws vide G.O.Ms.No.5/2012 dt., 05.03.2012.
6. Energy audit & annual reduction to be planned and intimated to this office and furnish an annual report.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

528 | 05/4/17

STRIDES SHASUN LIMITED Puducherry 605 014 PERIYAKALAPET

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/ 1700 Puducherry, the 31 MAR 2017

Consent is hereby granted to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry, to operate their **Zero Liquid Discharge plant with Multiple Effect Evaporator (250 KLD capacity) and new Briquette fired boiler (16 TPH capacity)** under the Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent valid upto : 31.01.2018.

III. Manufacturing Products : Ibuprofen – 359 TPM,
Ibuprofen Dc – 20 TPM,
IbuDerivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) – 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D
Total – 400 TPM.

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m.

V. **Specific Conditions:**

1. The unit shall stop the marine discharge of treated effluent within the end of the validity of this consent order after stabilization of the Multiple Effect Evaporator (MEE) & Agitated Thin Film Drier (ATFD) and also completely dismantle and remove the marine discharge pipelines.

2. The fresh water requirement for process plant and associated utilities shall not exceed the existing consumption of 110 KLD.

3. The additional water required to the tune of 590 KLD for the MEE and new boiler shall be met from (a) the Treated Sewage Water to be procured from the PWD Sewage Treatment Plant at Karuvadikuppam and transported through trucks and (b) internal recovery& reuse of waste water.

4. In case of unavailability of treated sewage water from PWD Sewage Treatment Plant at Karuvadikuppam, the unit shall arrange treated waste water from other alternative sources, institutions like medical colleges for operation of MEE. The unit shall submit agreement in this regard to this authority within 2 months.

5. If the unit is not able to operate the ZLD / MEE plant for want of treated waste water or failure to dispose the MEE salt and ETP sludge, the unit shall stop production immediately under intimation to this authority.

6. The unit shall install sufficient number of water meters to measure the quantity of water consumed from different sources and for different purposes and shall maintain proper logbooks for water consumed.

7. Proper logbooks of MEE operation and also showing the quantity of effluent generated, fed to MEE, recycled / reused and discharged for gardening shall be maintained and furnished to the Puducherry Pollution Control Committee every month.

8. The unit shall provide flow meters to measure the inlet, recycled and evaporated water quantity in ZLD.

9. The unit shall provide separate energy meters for ZLD plant.

10. The unit shall continue to connect to Online monitoring system for bore well water flow meter reading to PPCC.

11. The unit shall strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste viz. Chemical Sludge from MEE, in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016. Authorization from the PPCC must be obtained for collection / treatment /storage /disposal of hazardous wastes.

12. The chemical sludge from MEE shall be stored in separate designated hazardous waste storage facility with impervious bottom and leachate collection facility, before its disposal.

13. The chemical sludge from MEE shall be disposed to the cement plant of M/s. Ultratech Cement Industry situated at Reddipalayam Cement Works, Ariyalur, Tamil Nadu for co-processing. The unit shall obtain NOC/intimate to TNPCB and PPCC before handing over the waste to the transporter.

14. If the unit intends to dispose the chemical sludge from MEE to any [Treatment, Storage and Disposal facility (TSDF) for hazardous waste] for land fill or other purposes, the unit shall obtain NOC from TNPCB and PPCC for transportation of Hazardous Waste.

15. The unit shall connect the effluent from M/s. Strides Shasun Unit – II to ZLD plant of M/s. Strides Shasun Unit – I.

16. All other conditions stipulated in Water consent order (Renewal) dated 01.02.2017 remains valid until the removal and dismantling of marine discharge pipelines.

VI. <u>Implementation Schedule:</u>

1. The unit shall provide list of flow meters with number, purpose and Calibration certificates of all flow meters shall be submitted to PPCC before commencement of operation.

2. The unit shall connect the flow meter reading of inlet, recycled and evaporated water quantity in ZLD to online monitoring system after full fledged operation of ZLD.

3. Separate pipeline for collection of leaching effluent from the ETP sludge and MEE salt storage shed has to be provided.

4. Pipe lines from existing Sewage treatment plant collection tank to be provided to ZLD plant.

5. All incoming line from process plant to collection tank and outgoing lines from collection tank to ZLD system shall be marked.

6. The unit shall intimate in writing to PPCC whenever the existing pipeline from process area to new ZLD is changed.

7. Internal pipeline from Collection tank to old ETP area shall be removed in presence of officials from PPCC and with prior intimation.

8. Water from Old ETP shall be drained and all inlet lines to old ETP shall be closed.

9. The unit shall submit evaluation report of ZLD with water consumption, water recycled, salt accumulated and power consumed after commencement of trail run and during full fledged operation.

VII. General Conditions:

1. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

2. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 27(2) of Water (Prevention and Control of Pollution) Act, 1974 to review any or all the conditions imposed herein and to revoke, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.

3. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

VIII. Better Environmental Management Practices:

1. Appropriate Rain Water Harvesting Structures shall be established on scientific basis.

2. Efficient and effective waste management practices to be ensured to reduce, reuse and recycle all types of Wastes.

3. Adoption of Green Waste Management within the campus itself using appropriate technology / methods.

4. Fixtures for showers, toilet flushing and drinking water should be of low flow type and restricted to requirements by use of aerators, avoiding wastage by pressure reducing devices or sensor based controls.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

No.7528/PPCC/NOC/OM/JE/2015/882
GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III FLOOR, PHB BUILDING, ANNA NAGAR, PUDUCHERRY-5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

194
15/9/15

Puducherry, the 14 SEP 2015

Sir,

Sub: PPCC – CTE/NOC from Pollution angle to M/s. Shasun Pharmaceuticals Limited, Periyakalapet, Oulgaret Municipality, Puducherry - for establishing New Boiler and Multiple Effect Evaporator (MEE) – Reg.

Ref: i) Minutes of 147th PPCC meeting held on 28.08.2015
ii) Your letter No. SPL/U-I&II(No 102)/PPCC/NOC/MEE-BLR/CON/ 2015-2016 dt. 01.07.2015
iii) Your letter No. SPL/U-I&II(No 101)/PPCC/NOC/MEE-BLR/CON/ 2015-2016 dt. 20.05.2015
iv) Your letter No. SPL/U-I/PPCC/NOC/CON/JUST/2015-2016 dt. 23.04.2015
v) Your letter No. SPL/U-I/PPCC/NOC/CON/FEES/01/2015-2016 dt. 20.04.2015
vi) Your letter No. SPL/U-I/PPCC/NOC/CON/2015-2016 dt. 15.04.2015
vii) Your letter No. SPL/Unit-I/PPCC/NOC/BLR/2015-2016 dt. 09.04.2015

* * *

With reference to the subject mentioned above, it is informed that your proposal for installation of Multiple Effect Evaporator (250 KLD capacity) and replacing the existing boilers with new Briquette fired Boiler (16 TPH capacity) was discussed in the 147th PPCC meeting held on 28.08.2015 and the committee decided to decided to clear the proposal, subject to the following conditions:

i) The unit shall stop the marine discharge of treated effluent within one year from the commissioning of the MEE and also completely dismantle and remove the marine discharge pipelines.
ii) The fresh water requirement shall not exceed the existing capacity of 110 KLD.
iii) The additional water required to the tune of 590 KLD for the MEE and new boiler shall be met from (a) the Treated Sewage Water to be procured from the PWD Sewage Treatment Plant at Karuvadikuppamand transported through trucks and (b) internal recovery& reuse of waste water.
iv) The unit shall make necessary binding agreement with PWD for procurement of treated waste water from their Sewage Treatment Plant at Karuvadikuppam. Consent to Establish for the MEE and new boiler shall be issued thereafter.
v) The unit shall install sufficient number of water meters to measure the quantity of water consumed from different sources and for different purposes and shall maintain proper logbooks for the water consumed.
vi) Proper logbooks of MEE operation and also showing the quantity of effluent generated, fed to MEE, recycled / reused and discharged for gardening shall be maintained and furnished to the Puducherry Pollution Control Committee every month.
vii) There shall be no odour emission from the MEE and proper arrangements shall be made to monitor and control the odorous chemicals.
viii) Flue gas from the 16 TPH Briquette Fired Boiler shall be controlled with adequate air pollution control equipments (APCEs) viz. Bag Filters and the PM emission shall not exceed 150 mg/Nm3. The APCEs shall be operated efficiently and effectively to achieve the emission norms at stack outlets. Minimum stack height of 30 meters or higher than the surrounding buildings, whichever is higher, shall be provided for the flue gas emission.
ix) The unit shall strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste viz. Chemical Sludge from MEE, in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules 2008. Authorization from the PPCC must be obtained for collection / treatment /storage /disposal of hazardous wastes.

x) The chemical sludge from MEE shall be stored in separate designated hazardous waste storage facility with impervious bottom and leachate collection facility, before its disposal.

xi) The chemical sludge from MEE shall be disposed to the Common Hazardous Waste Treatment Storage and Disposal Facility at Gummidipoondi. The unit shall make a proper agreement with the disposal facility and also obtain NOC from TNPCB for trans-boundary movement of Hazardous Waste. Consent to Establish for the MEE and new boiler shall be issued thereafter.

xii) The unit has requested for enhancement of power from the present approved HT Power supply of 3360 KVA to 3860 KVA i.e. 500 KVA additional power for Boiler and MEE. PPCC in principle has No-Objection to the power enhancement. The actual requirement of the power would be assessed by the Electricity Department while granting the actual connection.

xiii) The new 1500 KVA DG Set proposed for power back up of Boiler & MEE operation shall be operated during power failure only and shall have Type Approval Certificate issued by Agencies authorized by Central Pollution Control Board. It shall meet the noise and air emission standards prescribed under The Environment (Protection) Rules, 1986 and shall be provided with integral acoustic enclosure.

Accordingly, you are directed to furnish the following documents to this Authority for issue of Consent to Establish:

i) Copy of binding agreement with PWD for procurement of treated waste water from their Sewage Treatment Plant at Karuvadikuppam.

ii) Agreement with Common Hazardous Waste Treatment Storage and Disposal Facility at Gummidipoondi for disposal of the chemical sludge from MEE and NOC from TNPCB for trans-boundary movement of Hazardous Waste.

The construction / erection activity shall not be commenced without obtaining the Consent to Establish from Puducherry Pollution Control Committee.

For & on behalf of PPCC,

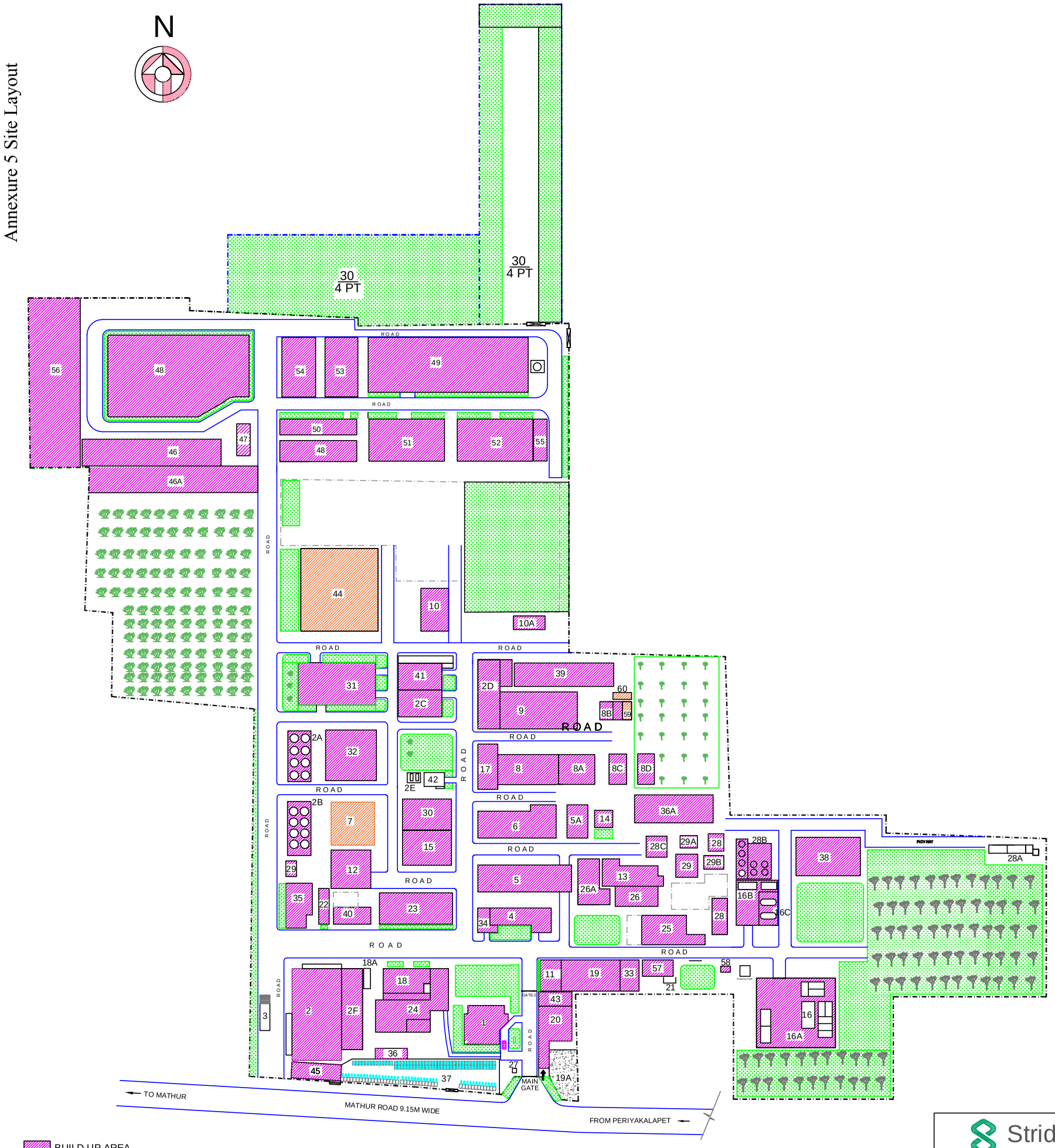
(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Shasun Pharmaceuticals Limited,
R.S. No. 32, 33 & 34, Mathur Road,
Periyakalapet, Oulgaret Municipality,
Puducherry – 14

Copy to:
i) Guard File.

Annexure 4 – Land Details to be provided as digital copy

Annexure 5 Site Layout



NO.	BLOCK NAME
1	ADMINISTRATION BLOCK
2	R.M STORES-1
2A	R.M STORAGE TANKS - 1
2B	R.M STORAGE TANKS - 2
2C	DRUM STORAGE SHED
2D	IBU DERIVATIVE CLEAN ROOM - I
2E	RM STORAGE TANKS - 3
2F	IBUPROFEN FINISHED PRODUCT STORAGE - 2
3	WEIGHING BRIDGE
4	Q.C LAB
5	IBUPROFEN SECTION
5A	IBUPROFEN SOLVENT STORAGE AREA
6	PILOT PLANT
8	ALDEHYDE SECTION
8A	ALDEHYDE SECTION (ATFE)
8B	REBOILER SECTION
8C	ALDEHYDE TANKS YARD
8D	IBAP TANKS YARD
9	IBU DERIVATIVE SECTION
10	IBU DERIVATIVE F.P STORAGE - 2 / SAFETY DEP
10A	ETP HAZORDOUS SECURED LAND FILL AREA
11	IBUPROFEN FINISHED PRODUCT STORAGE - 3
12	IBUPROFEN PACKING SECTION - II
13	CHILLING PLANT - OLD
14	PURIFIED WATER GENERATION PLANT
15	IBUPROFEN PACKING SECTION - I
16	HOSE STORAGE SHED (CLASS - A)
16A	CLASS 'A' PETROLEUM STORAGE
16B	CLASS 'B' PETROLEUM STORAGE
16C	CLASS 'C' PETROLEUM STORAGE
17	IBU DERIVATIVE CLEAN ROOM - II
18	GENERAL STORES
18A	CYLINDER STORAGE SHED
19	POWER HOUSE
19A	H.T YARD
20	SECURITY OFFICE - 1
21	GARDEN IN-CHARGE ROOM
22	ACTIVATED CARBON & REJECTED ROOM
23	IBUPROFEN PHARMA SECTION
24	CANTEEN,REST ROOM,RFT,QA, IT DEPT. AND Q.C RESERVE SAMPLE ROOM
25	BOILER HOUSE,AIR COMPRESSOR & NITROGEN PLANT
26	CHILLING PLANT (NEW)
26A	CHILLING PLANT TANKS YARD
27	VINAYAGAR TEMPLE
28	LAYER COLLECTION TANKS
28A	EFFLUENT PUMP HOUSE
28B	WASTE DICHROMATE STORAGE TANKS
28C	SOURCE WATER STORAGE TANK
29	1500 TR - COOLING TOWER
29A	500 TR - COOLING TOWER
29B	500 TR - COOLING TOWER
30	IBUPROFEN FINISHED PRODUCT STORAGE - 1
31	ENGNEERING SECTION
32	NEW IPCA SECTION
33	ELECTRICAL WORK SHOP
34	PANEL ROOM
35	FIRE HYDRANT SYSTEM
36	TOILET
36A	R.O PLANT (BOILER FEED)
37	TWO WHEELER SHED
38	EFFLUENT TREATMENT PLANT (OLD)
39	IBU DERIVATIVE TANK YARD
40	RECOVERY PLANT
41	SODIUM SECTION
42	IBU DERIVATIVE FINISHED PRODUCT STORAGE
43	CAR SHED
45	SECURITY OFFICE - 2
46	CONTRACTORS WELDING SHED
46A	CONTRACTORS SHED
47	TOILET
48	BIOLOGICAL TREATMENT PLANT
49	NEW BOILER SHED & TURBINE
50	MULTIPLE EFFECT EVAPORATOR
51	FUEL STORAGE SHED
52	OLD BOILER SHED
53	TREATED WATER STORAGE
54	RO PLANT,COOLING TOWER & MCC PANEL ROO
55	WATER PRE - TREATMENT PLANT
56	SCRAP YARD
57	DIESEL GENERATOR
58	BREATHING AIR COMPRESSOR
	PROPOSED NEW BLOCKS
7	NEW PRODUCTION BLOCK -2
44	NEW PRODUCTION BLOCK-1
59	HYDROGENATION SHED
60	HYDROGEN CYLINDER SHED

Strides Shasun Limited
MATHUR ROAD, PERIYAKALAPET, PUDUCHERRY-14

Title
SITE PLAN

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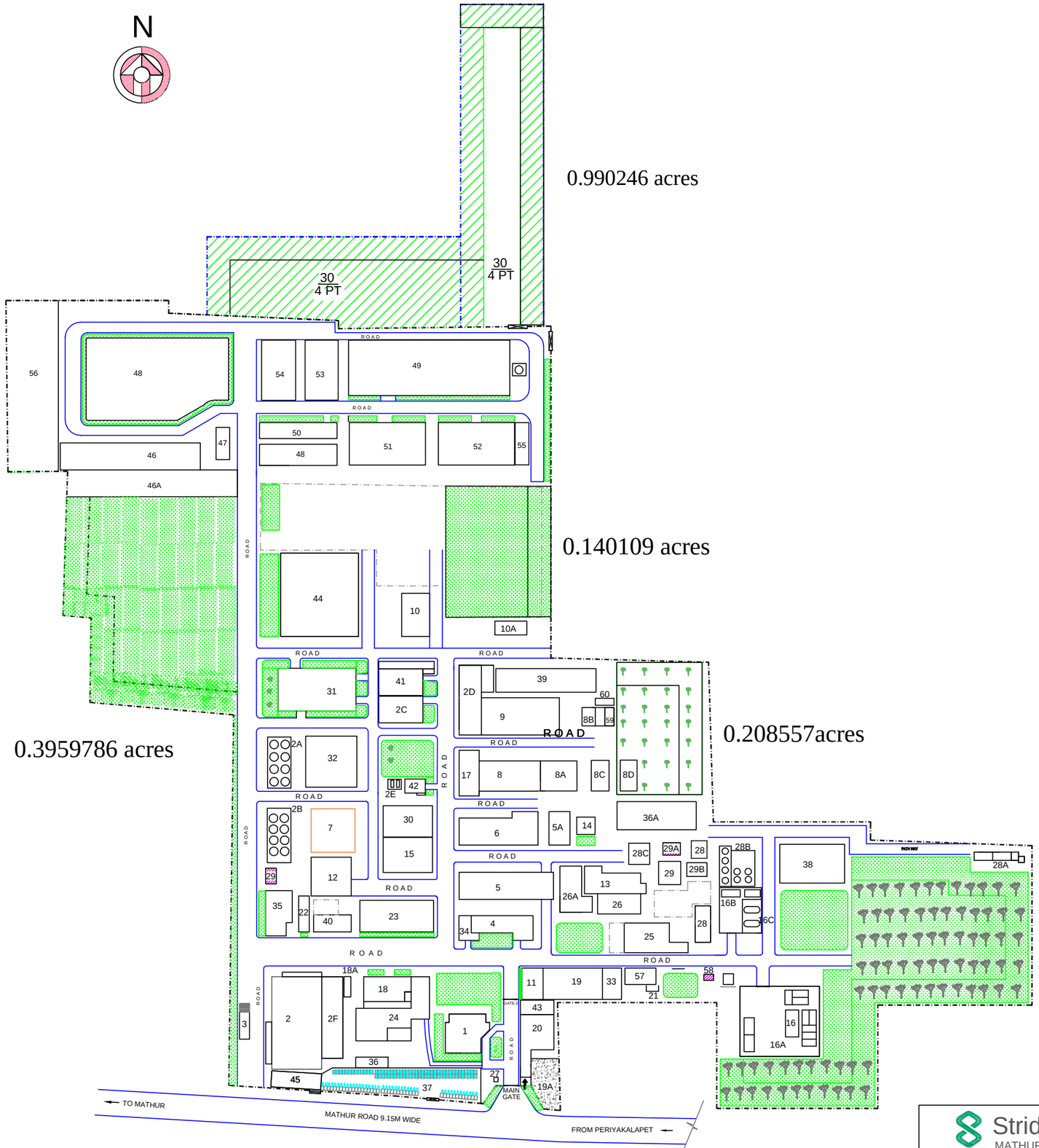
FILE NAME	D:\SITE PLAN	REV.
DRG.NO.	PYA / SP - 01	R(

Annexure 6 Greenbelt layout



NO.	BLOCK NAME
1	ADMINISTRATION BLOCK
2	R.M STORES-1
2A	R.M STORAGE TANKS - 1
2B	R.M STORAGE TANKS - 2
2C	DRUM STORAGE SHED
2D	IBU DERIVATIVE CLEAN ROOM - I
2E	RM STORAGE TANKS - 3
2F	IBUPROFEN FINISHED PRODUCT STORAGE - 2
3	WEIGHING BRIDGE
4	Q.C LAB
5	IBUPROFEN SECTION
5A	IBUPROFEN SOLVENT STORAGE AREA
6	PILOT PLANT
8	ALDEHYDE SECTION
8A	ALDEHYDE SECTION (ATFE)
8B	REBOILER SECTION
8C	ALDEHYDE TANKS YARD
8D	IBAP TANKS YARD
9	IBU DERIVATIVE SECTION
10	IBU DERIVATIVE F.P STORAGE - 2 / SAFETY DEP
10A	ETP HAZORDOUS SECURED LAND FILL AREA
11	IBUPROFEN FINISHED PRODUCT STORAGE - 3
12	IBUPROFEN PACKING SECTION - II
13	CHILLING PLANT - OLD
14	PURIFIED WATER GENERATION PLANT
15	IBUPROFEN PACKING SECTION - I
16	HOSE STORAGE SHED (CLASS - A)
16A	CLASS 'A' PETROLEUM STORAGE
16B	CLASS 'B' PETROLEUM STORAGE
16C	CLASS 'C' PETROLEUM STORAGE
17	IBU DERIVATIVE CLEAN ROOM - II
18	GENERAL STORES
18A	CYLINDER STORAGE SHED
19	POWER HOUSE
19A	H.T YARD
20	SECURITY OFFICE - 1
21	GARDEN IN-CHARGE ROOM
22	ACTIVATED CARBON & REJECTED ROOM
23	IBUPROFEN PHARMA SECTION
24	CANTEEN,REST ROOM,RFT,QA, IT DEPT. AND Q.C RESERVE SAMPLE ROOM
25	BOILER HOUSE,AIR COMPRESSOR & NITROGEN PLANT
26	CHILLING PLANT (NEW)
26A	CHILLING PLANT TANKS YARD
27	VINAYAGAR TEMPLE
28	LAYER COLLECTION TANKS
28A	EFFLUENT PUMP HOUSE
28B	WASTE DICHROMATE STORAGE TANKS
28C	SOURCE WATER STORAGE TANK
29	1500 TR - COOLING TOWER
29A	500 TR - COOLING TOWER
29B	500 TR - COOLING TOWER
30	IBUPROFEN FINISHED PRODUCT STORAGE - 1
31	ENGNEERING SECTION
32	NEW IPCA SECTION
33	ELECTRICAL WORK SHOP
34	PANEL ROOM
35	FIRE HYDRANT SYSTEM
36	TOILET
36A	R.O PLANT (BOILER FEED)
37	TWO WHEELER SHED
38	EFFLUENT TREATMENT PLANT (OLD)
39	IBU DERIVATIVE TANK YARD
40	RECOVERY PLANT
41	SODIUM SECTION
42	IBU DERIVATIVE FINISHED PRODUCT STORAGE
43	CAR SHED
45	SECURITY OFFICE - 2
46	CONTRACTORS WELDING SHED
46A	CONTRACTORS SHED
47	TOILET
48	BIOLOGICAL TREATMENT PLANT
49	NEW BOILER SHED & TURBINE
50	MULTIPLE EFFECT EVAPORATOR
51	FUEL STORAGE SHED
52	OLD BOILER SHED
53	TREATED WATER STORAGE
54	RO PLANT,COOLING TOWER & MCC PANEL ROO
55	WATER PRE - TREATMENT PLANT
56	SCRAP YARD
57	DIESEL GENERATOR
58	BREATHING AIR COMPRESSOR
	PROPOSED NEW BLOCKS
7	NEW PRODUCTION BLOCK -2
44	NEW PRODUCTION BLOCK-1
59	HYDROGENATION SHED
60	HYDROGEN CYLINDER SHED

	EXISTING GREEN BELT AREA	29919 Sq.M (7.39 Acres)
	PROPOSED GREEN BELT AREA	7274 Sq.M (1.80 Acres)
	TOTAL GREEN BELT AREA	37193 Sq.M (9.19 Acres)

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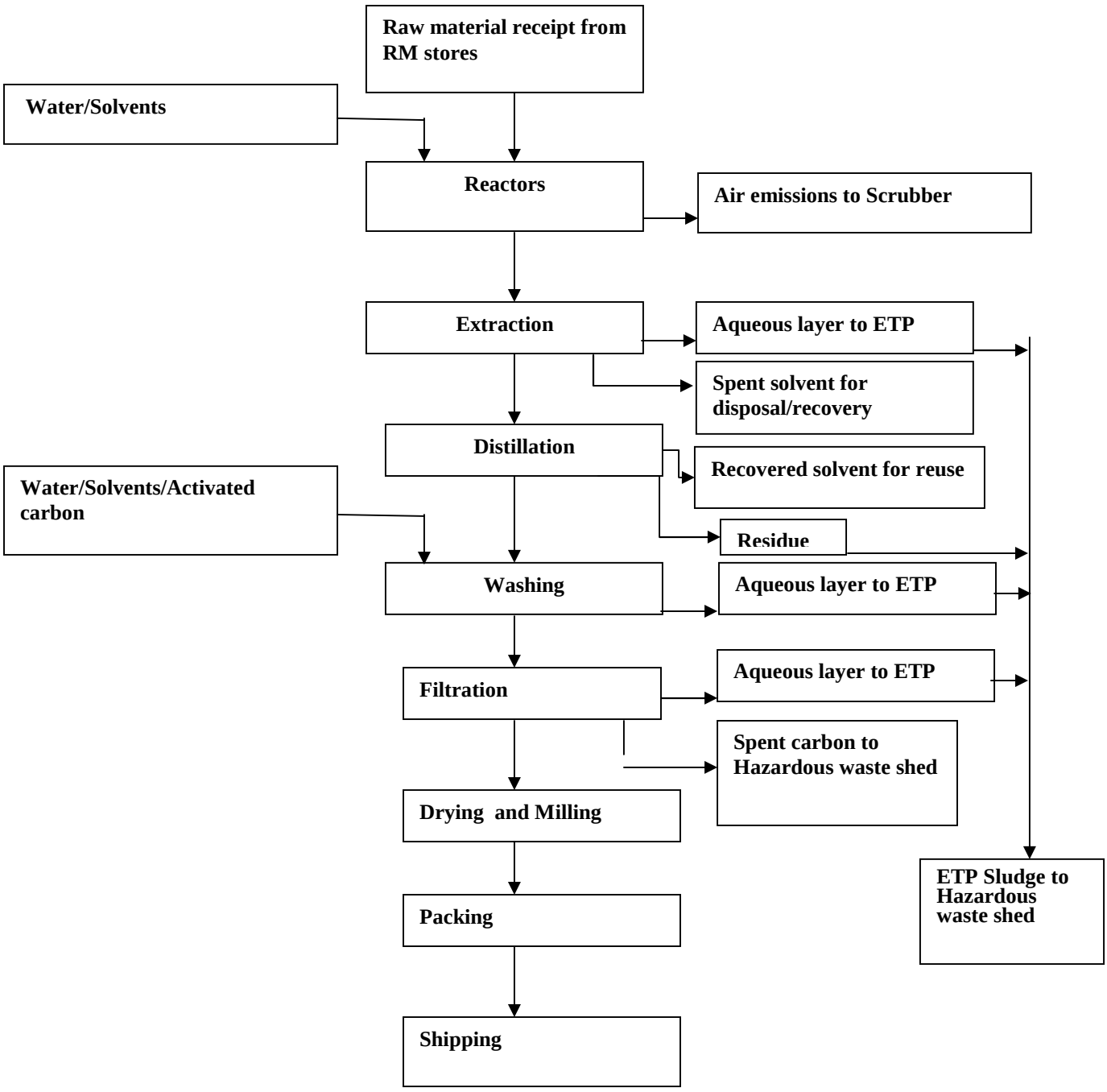
Title

GREEN BELT LAYOUT

FILE NAME	D:\SITE PLAN	REV.
DRG.NO.	PYA / SP - 01	R(

PROCESS FLOW DIAGRAM



PROCESS Description

IPCA

A mixture of IPA, sulphuric Acid and mono chloro acetic acid into the reactor and maintained the reaction and allow for settling, then separate the aqueous layer and acid layer. Then Charge sodium bicarbonate and stir. The bottom sodium bicarbonate layer transfer to the neutralized IPCA reactor stir and allow to settle. After settling Separate the bottom layer from the reactor and transfer neutralized IPCA to distillation reactor. Distill the reaction mass in the reactor under the vacuum and collect the distillate and cool the mass to 30 degrees and transfer the Iso propyl chloro acetate (IPCA) in tank.

ALDEHYDE

Charge IPA and ferric chloride into reactor and Purge Nitrogen and add sodium metals. Maintain thereaction tillsodium metal dissolves completely and Charge IPA into reactor Cool IBAP +IPCA mixture and add slowly sodium to the reaction mass. After addition maintain for 2 hour and Start IPA distillation to get epoxy ester and transfer the epoxy ester into another collection tank. Feed epoxy ester and add Caustic lye solution simultaneously into the tank through static mixture. Add HCL slowly into reactor and maintain the temp 60*c-80*c, and allow to settle, then transfer bottom aqueous layer into chemical drain. Transferthe top reaction mass for distillation section to get the Pure aldehyde distillation and discard the residue as waste.

Ibuprofen .

The Mixture of dilute sulphuric acid and Sodium Dichromate is prepared in the name of Jones Reagent and cool the reagent to less than 30 Degree and transfer Jones Reagent into charge tank. Charge Acetone into the reactor and add Jones reagent under vacuum with aldehyde slowly. Charge process water into the reaction mass to another reactor for Acetone distillation.After distillation charge hexane into reactor for extraction and allow to settle to remove waste sodium Dichromate solutions. Then transfer organic layer to another reactor for the purification with water. After purification add Activated carbon for bleaching and transfer the organic mass for crystallization. After crystallization filter the mass and wash with hexane to get the wet Ibuprofen and collect the Mother liquor separately.The wet ibuprofen followed by drying and packing. the collected Mother

liquor is charged to distillation setup to recover hexane for reuse and discard the residue as waste.

Ibuprofen DC.

In the mixture of Ibuprofen and Microcrystalline Cellulosetaken in the granulator and add Starch solution to get the desired granules size. Further the granulate material taken into dryer, sieving and packing

Ibuprofen Sodium.

Toluene is charged into the reactor and Ibuprofen is added under stirring and heated and add caustic lye solution into the reactor and the mass is stirred.Heat the mass to 80 ° Cand filter the reaction mass into the crystallizer with addition of toluene for washing. Further cool the mass then centrifuged the product and dried.The mother liquor is send for distillation to recover toluene for reuse.

Ibuprofen Lysine

Ibuprofen is dissolved in Isopropyl alcohol and heated the mass to 50°C and filtered into the crystallizer. Add Dl-Lysine solution and followed by IPA addition. The mass is cool for 2 hours in the crystallizer. The crystallized product is centrifuged and dried.

SPBA-RSPBN

To a mixture of Benzyl cyanide, caustic lye solution and Benzyl triethylammonium chloride ,Isopropyl bromide is added to get (RS)- Phenyl butyl nitrile (RSPBN).

SPBA-RSPBA-

RSPBN further reduced using Raney nickel catalyst to get (RS)- Phenyl butyl amine (RSPBA). Further RSPBA is resolved to get S (+)-Phenyl butyl amine.

SPBA-SALT-

RSPBN further taken in the reactor and add IPA for extraction to get the SPBA Salt, then further the salt is taken for extraction by adding toluene and water , stir and settle for

layer separation . The aqueous layer taken for recovery process and the organic layer taken for distillation to distill toluene for reuse. The pure SPBA is taken for process after distillation.

SPBA-Recovery -

The Mother liquor in all the SPBA steps , fed in to the reactor to extract RPBA by adding toluene and water after extraction toluene is distillate out and adding HCL and water to recover RSPBA for reuse.

S (+) Ibuprofen

Manufacture of DS1 & DS2 stage:

Ibuprofen was dissolved in Isopropyl alcohol and heat the reaction mass add (S)-3-Methyl-2-phenylbutyl amine slowly. After the addition, maintain the mass at 75±5° C for about an hour. Then gradually cool the mass to RT. Product starts to crystallize at 62±2° C. Further cool the mass to 5±2° C and stirred the mass at this temperature for about 1 hr. Isolate the product and wash with IPA.

The wet material is again slurry with mixture of Isopropyl alcohol. Then heat the reaction mass to reflux. Then gradually cool the mass to 5±2° C and stirred the mass at this temperature for about 1 hr. Isolate the product and wash with IPA. And then dried.

Manufacture of S-Ibuprofen:

Stage -2 is the desalting of stage-1 followed by purification of crude S-Ibuprofen in Hexane and water calculated hydrochloric acid is added. Stage -1I material was charged into the reaction mass at RT. Stirred the reaction mass for about 3 hrs. Isolate the product by separation organic layer and charged Hexane. Separate the bottom layer as waste. Hexane layer distilled out and the remaining the molten mass (crude Ibuprofen) was dissolved in methanol. After micron filtration the methanol solution was cooled to 5 ± 2° C. Then seed the mass with S-Ibuprofen. Slowly product start to crystallize. After crystallization isolate the product Dried and packed as per final specification.

CARISOPRODOL

STAGE-1:A mixture of diol (2-methyl-2-propyl-1,3-propanediol) and toluene is treated with dimethyl carbonate in the presence of catalytic quantity of sodium methoxide followed by high vacuum distillation produced 5-methyl-5-propyl-m-dioxanone (Stage-1).

STAGE- 2:A Mixture of Stage-1 and Isopropyl amine is heated and maintained for reaction completion, after this Isopropyl amine is distilled out completely. Further the mass is cooled and product Stage-2 ((N-Substituted mono carbamate) is getting isolated.

STAGE-3A: To the Stage-2 (N-Substituted mono carbamate) in Toluene Solution Sodium cyanate is added and stirred. Further this reaction mass cooled and Anhydrous Hydrochloric acid gas is purged. After reaction completion the toluene reaction mass is washed with Sodium bicarbonate solution followed by water. Further this reaction mass is treated with activated carbon and the filtrate taken to Next stage.

STAGE-3B: The filtered mass taken for Toluene distillation and the concentrated mass is dissolved in methanol, and further product precipitated out by adding water. The product is isolated and dried to get the dried Carisoprodol

PREGABALIN

STAGE-1: The racemic (±)-3-carbamoylmethyl-5-methylhexanoic acid is resolved with R(+)-Phenylethylamine in Chloroform. The Phenyl ethylamine salt of desired isomer was isolated as solid (Stage-1).

STAGE-2: The Phenyl ethylamine salt (Stage-1) is treated with Con.Hydrochloric acid in D.M.Water to obtain the Desired isomer of 3-carbamoylmethyl-5-methylhexanoic acid (Stage-2)

STAGE-3 : The resolved isomer of 3-carbamoylmethyl-5-methylhexanoic acid (Stage-2) is treated with the mixture of sodium hypochlorite and caustic lye solution to convert into 3-aminomethyl-5-methylhexanoic acid. Further to this mass Con. Hydrochloric acid and methanol is added and heated. This mass is further cooled to yield the Final product. The isolated solid is washed with water and Isopropyl alcohol mixture and dried to get the Pure Pregabalin product.

SAPROPRITEAN DI HYDROCHLORIDE- PROCESS.

Stage 1: Acetone, D-Ribose was charged and Conc.HCL was added to the reaction mass (white slurry mass). Reaction mass was heated and monitored by TLC. Then mass cooled. Sodium carbonate was charged to the reaction mass and allowed it to settle. pH was checked, then the inorganic solid was filtered and washed with acetone. Before distillation purity of stage 1 was checked. Distillation was carried out. After distillation THF was charged to the thick mass. Likewise, THF were co-distilled. When the mass got thickened lot-II THF were charged and stirred and submitted for acetone content and water content. While it complies THF lot-III were charged and submitted for GC purity.

Stage-2: Methyl magnesium chloride was charged and cooled and D-86 stage-1 solution was slowly added to the reaction mass. Then the reaction mass was heated. Sample submitted to QC for Stage-1 content in stage-2 by GC. Then the mass was cooled then the mass was added to the cooled purified water and PH monitored. Sample submitted to QC for PH analysis. After it complies three ethyl acetate extraction were charged and organic layer was separated. Stage-2 purity sample was submitted to QC. After it complies distillation were carried out. Ethyl acetate was charged and sample submitted to QC for stage-2 purity.

Stage-3: Purified water and sodium metaperiodate was charged and cooled. After cooling stage-2 mass was added slowly to the reaction mass. Then the temperature was raised and sample given

to QC for stage-2 content in stage-3. After compiles 30% of sodium carbonate solution was charged and PH was adjusted. Inorganic salts were filtered and washed with ethyl acetate. Reaction mass was settled and Aqueous layer was extracted by ethyl acetate. Sodium bicarbonate was charged to combined organic layer. Stage-3 purity sample were submitted to QC. Distillation was carried out and Toluene was charged to the thick mass. Activated carbon was charged and filtered. Stage-3 purity was analysed.

Stage-4: Stage-3 mass, HCl was charged and temperature raised then Stage-3 content in stage-4 was checked. Then the mass was cooled and bottom aqueous layer (Product layer) was isolated.

Stage-5: Stage-4 Product mass was charged, cooled and 8% sodium bicarbonate solution was charged and sample submitted to QC for PH analysis. Likewise, acetic acid was added and sample submitted to QC. Diisopropyl ether and Phenyl hydrazine was slowly added to the reaction mass. Sample submitted for Stage-4 content. Reaction mass was filtered and washed with diisopropyl ether. Then the wet material was dried under vacuum. Sample submitted to QC for water content. While it complies, mass was unloaded.

Stage-6: To a suspension of KSM-1 in ethyl acetate was added 4-Dimethylaminopyridine. To the mixture acetic anhydride was added. The reaction mass was stirred and quenched with organic layer was separated and washed with aqueous sodium carbonate. The mixture of purified water and methanol were added sodium dithionite, S28/KSM-2 and sodium acetate trihydrate. To the slurry mass was added aqueous ammonia followed by the organic layer containing stage1A slowly. Reaction mass temperature was raised and cooled then hydrogen peroxide was slowly added. The solid was filtered and washed. The wet material was unloaded.

Stage-7: The wet solid from stage-1 charged to the purified water and HCL was added slowly. The temperature of the reaction mass increased. Activated carbon was charged into the reaction mass and stirred and filtered. Sodium carbonate was added to the filtrate methanol and pH was adjusted. The product mass was filtered and washed with water and methanol. The wet solid was dried.

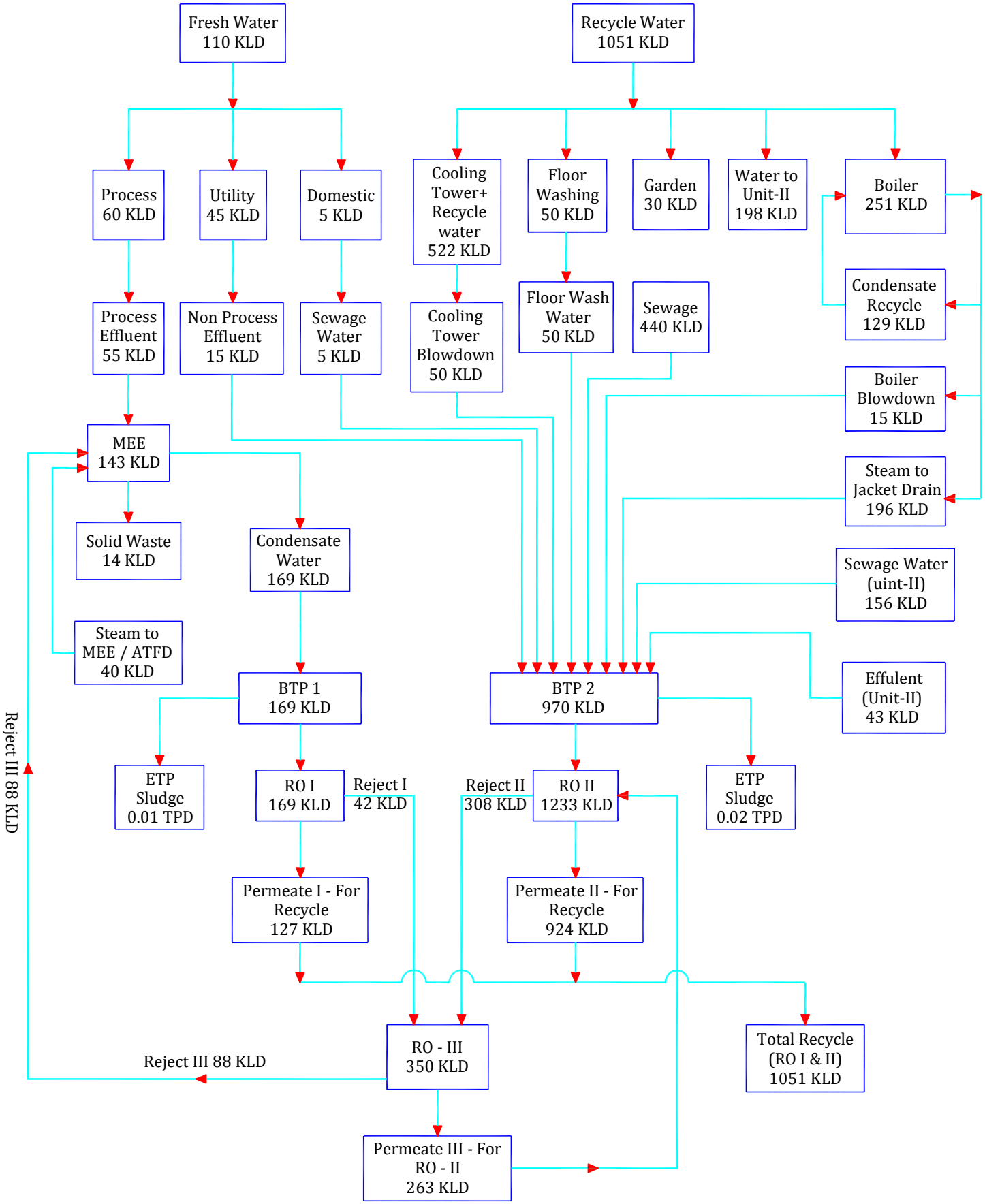
Stage-8: Purified water and triehtylamine was added with stage-2. After getting clear solution the mass was transferred to the hydrogenator with platinum oxide. The reaction mass was stirred under hydrogen pressure. The reaction mass was quenched with conc.HCL. The catalyst was removed by filtration and the filtrate was treated with carbon. The filtrate was concentrated under vacuum. The residue was added with acetone and stirred to get the product. The solid was filtered and washed with acetonitrile followed by acetone. Wet product was dried.

Stage-9: Conc. HCL and stage-3 mass was charged and rectified spirit added slowly. The reaction mass was cooled and stirred. The solid product was filtered and washed with acetone. Wet solid was dried. The dry solid was purified by this process two more times to get pure Sapropterindihydrochloride

Annexure 8 – MSDS to be provided as digital copy

WATER BALANCE FOR EXISTING

Annexure 9 Water Balance Drawing

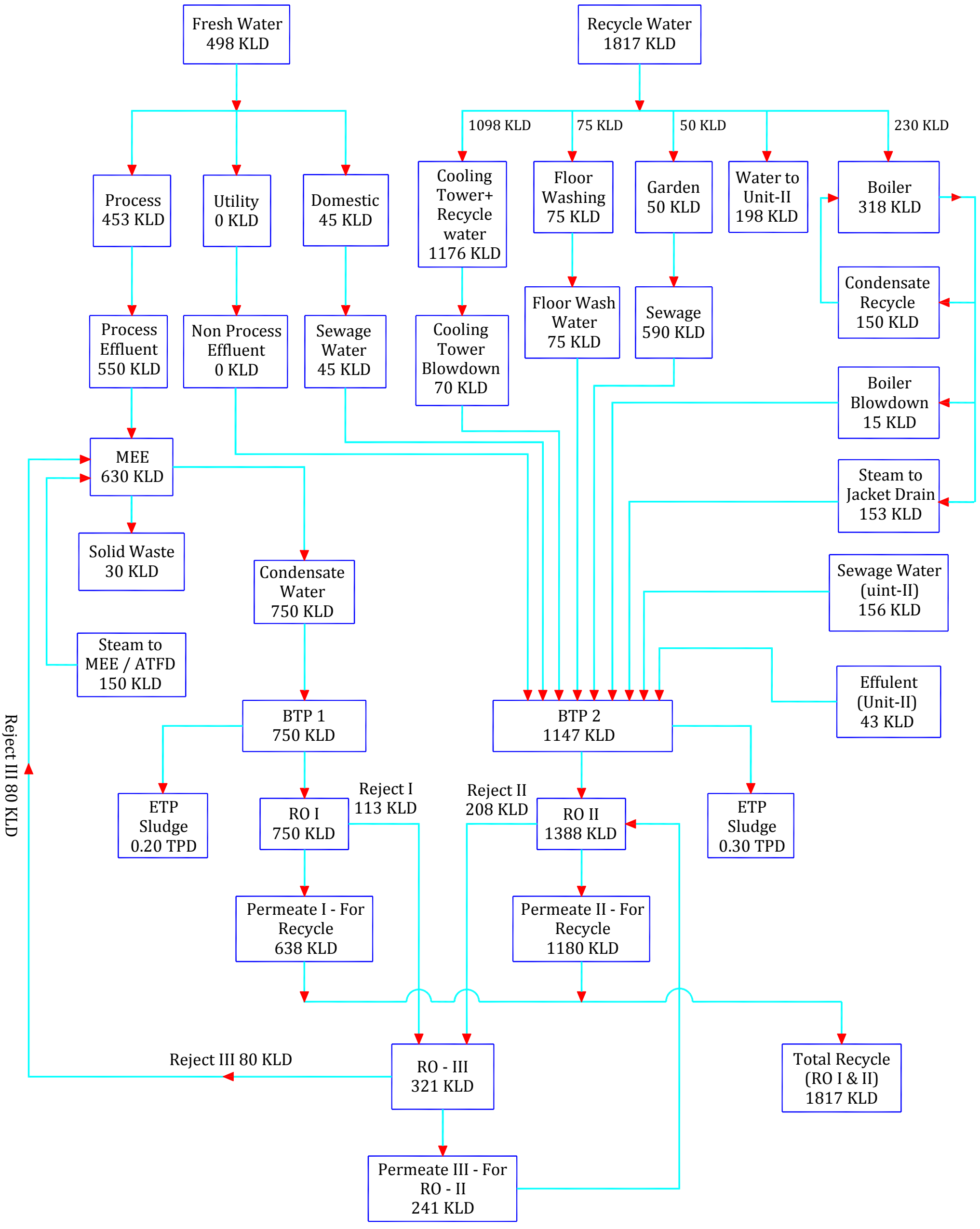


NOTES:	TITLE:	CLIENT:	CONSULTANT:
1. Not To Scale. 2. For Planning Purpose Only.	WATER BALANCE DRAWING	M/S. STRIDES SHASUN LIMITED, PONDICHERRY	HECS(P)Ltd, CHENNAI

IMD No.	DATE	SCALE	REV
—	19-09-17	—	0

DWG No: DD – HECS – WBD – 001

WATER BALANCE TOTAL [EXISTING + PROPOSED]



NOTES:

1. Not To Scale.
2. For Planning Purpose Only.

TITLE:

WATER BALANCE DRAWING

CLIENT:

M/S. STRIDES SHASUN LIMITED, PONDICHERRY

CONSULTANT:

HECS(P)Ltd, CHENNAI

IMO No.	DATE	SCALE	REV
—	19-09-17	—	0

DWG No: DD – HECS – WBD – 002

Annexure 10 - ZLD Adequacy Report

ETP SYSTEM

LIST OF EQUIPMENTS					
HPS Pre-Treatment Plant (300 KLD)					
S.No	**TITLE**	**MOC**	**TAG.No**	**QTY**	**CAPACITY**
1.	SS Screen	SS304	S-01	1	17 M3/Hr
2.	Feed pumps + Motor	SS304	P-01A/B	1W+1S	17 M3/Hr
3.	Mechanism for Oil Removal	SS304	OL-01	1	400L/Day
4.	Primary Sludge Transfer	CI	P-02A/B	1W+1S	5 M3/Hr
5.	Primary transfer Pumps	CI	P-03A/B	1W+1S	17 M3/Hr
6.	Primary clarifier Mechanism	MSEP	CL-01	1	17 m3/hr
7.	Neutralization tank Mixer	SS304	M-01	1	3 HP
8.	Flash Mixer	SS304	M-02	1	1.5 HP
9.	Flocculator mechanism	SS304	M-03	1	1.5 HP
10.	Acid/Alkali dosing Tank	PP/FR	DT-01	1	0.5 M3
11.	PAC dosing Tank with Mixer	PPP/FR	DT-02	1	0.5 M3
12.	Polymer dosing tank with	PPP/FR	DT-03	1	0.5 M3
13.	Acid/Alkali dosing pump	PPP	DP-01	1	0-40 LPH
14.	PAC dosing pump(Prim)	PP	DP-02	1	0-40 LPH
15.	Polymer dosing pump(Pri)	PP	DP-03	1	0-40 LPH
16.	Centrifuge Feed pumps	CI	P-09A/B	1W+1S	2-3
17.	Centrifuge system	SS304	Z-01	1	3M3/MH3r/hr
18.	Polymer dosing tank (cent)	SS304	DT-07	1	1.5 M3
19.	Polymer dosing pump(cent)	PP	DP-	1	150 LPH

LIST OF CIVIL TANKS & STRUCTURES					
Following are the list of RCC tanks / Structures require to be constructed -					
SR.NO	**CIVIL TANK / STRUCTURE**	**MOC**	**TAG NO.**	**Qty.**	**SIZE / VOLUME**
1.	Collection Tank	RCC+ABL		2	100 M3
2.	HPS Equalization Tank	RCC+ABL		1	320 M3
3.	Neutralization Tank	RCC		1	75
4.	Flash Mixer	RCC		1	5.4
5.	Flocculator	RCC		1	44
6.	Centrate Tank	RCC		1	44
7.	New Equalisation Tank for condensate collection	RCC+ABL	T-01A/B	1+1	100 M3
8.	Pre-Treated Effluent Storage Tank	RCC	-	1	150 M3
9.	Primary Clarifier	RCC	CL-01	1	50 M3
10.	Bioreactor - 1	RCC	T-03	1	800 M3
11.	Bio-reactor – 2	RCC	T-04	1	400 M3
12.	Bio-Clarifier – I	RCC	CL-02	1	50 M3
13.	Bio-Clarifier – II	RCC	CL-03	1	50 M3
14.	Tertiary Flocculator	RCC	T-05	1	3 M3
15.	Tertiary Clarifier	RCC	Cl-04	1	50 M3
16.	Sludge thickener.	RCC	T-10	1	50 M3
17.	Intermediate Sludge Holding Tank	RCC	T-11	1	10 m3
18.	Filter feed +Treated water Tank	RCC	T-05	1	100 M3

LIST OF EQUIPMENTS					
Bio-Treatment Plant					
S.No	**TITLE**	**MOC**	**TAG.No**	**QTY**	**CAPACITY**
1.	Feed pumps + Motor	SS304	P-01A/B	1W+1S	17 M3/Hr
2.	Bio-Sludge Re-circulation	CI	P-04A/B	1W+1S	17 M3/Hr
3.	Bio transfer Pumps	CI	P-05A/B	1W+1S	17M3/Hr.
4.	Bio-Sludge Re-circulation	CI	P-06A/B	1W+1S	17 M3/Hr
5.	Thickener Feed Pumps	CI	P-07 A/B	1W+1S	5 m3/hr
6.	Sludge Thickener Mechanism	MSEP	M-05	1	5 m3/hr
7.	Sand filter feed pumps	CI	P-08A/B	1W+1S	20 M3/Hr
8.	Mixing Air Blowers	CI	B-01A/B	1W+1S	275 CMH
9.	Air Grid in Eq. Tank	PP	G-01	6	275 CMH
10.	Bio- Clarifier Mechanism – 1	MSEP	CL-02	1	17 M3/Hr
11.	Bio- Clarifier Mechanism – 2	MSEP	CL-03	1	17 M3/Hr
12.	Aeration Air Blowers	CI	B-01A/B	1W+1S	1200m3/
13.	Diffusers Grid	PP/MS	G-02	24	Disc type
14.	Tertiary Clarifier	MSEP	L-04	1	17 M3/Hr
15.	Activated Carbon Filter	MSEP	ACF-01	1	17 m3/Hr
16.	Pressure Sand Filter	MSEP	PSF-01	1	17 m3/Hr
17.	PAC dosing pump(Tertiary)	PP	DP-04	1	0 – 40
18.	Polymer Dosing Pump (Tert)	PP	DP-05	1	0 – 40

MECHANICAL EQUIPMENT SPECIFICATIONS		
1.	**PERFORATED SCREEN (S-01) –**	
	Application	Screening of incoming effluent
	Tag No	S-01
	Duty / Capacity	17 M3/Hr.
	MOC	SS304
	Quantity	1 Nos.
	Type	Rectangular Plate Type
2.	**AIR GRID FOR EQUALIZATION TANK (G-01)**	
	Application	Air agitation for solid suspension.
	Tag No	G-01
	Dimension (Dia.)	3” OD Pipe.
	MOC	PP
	Quantity	6 Nos.
	Type	Coarse Bubble type
3.	**FEED PUMP (P – 01A/B) –**	
	Application	Feeding equalized effluent to Neutralization Tank
	Tag No	P-01 A/B
	Capacity	17 M3/Hr.
	MOC	PP
	Quantity	2(1W +1S)
	Type	Centrifugal Self-Priming
4.	**PRIMARY CLARIFIER MECHANISM (M-04) –**	
	Application	Settling and removal of Suspended Solids
	Tag No	M-04
	MOC	MSEP
	Quantity	1 Nos.
	Capacity	17 M3/Hr.
	Speed	0.08 rpm
	Type	Central Drive Rake Arm Mechanism
	Prime Mover	Geared Motor
	Motor Capacity	0.5 HP

5.	**PRIMARY TRANSFER PUMP (P-02A/B)**	
	Application	Transfer primary treated effluent to Bio-Reactor I (T-04)
	Tag No	P-03 A/B
	Capacity	17 M3/Hr.
	MOC	CI
	Quantity	2(1W +1S)
	Type	Centrifugal Self-Priming
	Location	Near Primary Clarifier tank (T-03)
6.	**AIR BLOWERS (B – 01 A/B) –**	
	Application	For aeration in Bio-reactors 1&2
	Tag No	B-01 A/B
	Duty	1200 m3 / hr
	MOC	CI
	Quantity	2 (1W+1S)
	Type	Tri-Lobe / Screw Blower
	Power	40 HP
7.	**AIR GRIDS IN BIO-REACTOR –**	
	Application	Aeration in bio-reactors I & II
	Tag No	G-02
	Duty / Capacity	45 m3/hr per grid
	MOC	PP Grids with MSEP supports
	Quantity	24
	Type	Coarse bubble fixed.
	Location	Bottom floor of Bio-Reactors I & II
8.	**DIFFUSERS –**	
	Application	Fine bubble aeration IN Bio-Reactors I & II
	Tag No	-NA-
	Dimension	12” Dia.
	MOC	PP Body with Teflon coated EPDM membrane
	Quantity	One Lot
	Type	Fine bubble disc type
	Location	In Bio-reactor 1 & 2.

9.	**BIO-CLARIFIER – 1 MECHANISM (M-05) –**	
	Application	Settling and removal of Bio-solids
	Tag No	M-05
	MOC	MSEP
	Quantity	1 Nos.
	Capacity	30 M3/Hr.
	Speed	0.08 rpm
	Type	Central Drive with Rake Arm Mechanism
	Prime Mover	Geared Motor
	Motor Capacity	0.5 HP
10.	**BIO TRANSFER PUMP (P – 04A/B) –**	
	Application	Transfer of BC-1 supernatant to extended aeration.
	Tag No	P-05 A/B
	Capacity	20 M3/Hr.
	MOC	CI
	Quantity	2(1W +1S)
	Type	Centrifugal Self-Priming
	Motor	3 HP
11.	**RE-CIRCULATION PUMP - 1 (P – 03A/B) –**	
	Application	Recirculation of activated sludge in Bio-Reactor –1
	Tag No	P-04 A/B
	Capacity	30 M3/Hr.
	MOC	CI
	Quantity	2(1W +1S)
	Type	Centrifugal Self-Priming
	Motor	3 HP

12.	**ANOXIC TANK MIXER (M-06) –**	
	Application	To Maintain suspension of biomass in Anoxic Tank
	Tag No	M-06
	MOC	SS304
	Quantity	1 Nos.
	Capacity	300 m3/hr Mixing rate
	Type	Marine Propeller
13.	**BIO-CLARIFIER – 2 MECHANISM (M-07) –**	
	Application	Settling and removal of Bio-solids
	Tag No	M-07
	MOC	MSEP
	Quantity	1 Nos.
	Capacity	30 M3/Hr.
	Speed	0.08 rpm
	Type	Central Drive with Rake Arm Mechanism
	Prime Mover	Geared Motor
	Motor	0.5 HP
14.	**RE-CIRCULATION PUMP - 2 (P – 05A/B) –**	
	Application	Recirculation of activated sludge in Bio-Reactor –2(T-06)
	Tag No	P-06 A/B
	Capacity	30 m3/hr
	MOC	CI
	Quantity	2(1W +1S)
	Type	Centrifugal Self-Priming
	Motor	3 HP

15.	**REACTIVATOR FLOCCULATOR (M-08) –**	
	Application	Mixing in Reactivator Hold Tank
	Tag No	M-08
	MOC	MSEP
	Quantity	1 Nos.
	Type	Turbine
	Prime Mover	Geared Motor
	Motor	1 HP
16.	**PAC DOSING PUMP [REACTIVATOR] (DP-04) –**	
	Application	Dosing Coagulant in Reactivator Clarifier Hold Tank
	Tag No.	DP-04
	Capacity	0 – 40 LPH
	MOC	PP
	Quantity	1 Nos.
	Type	Electronic diaphragm type
17.	**REACTIVATOR CLARIFIER MECHANISM (M-09) –**	
	Application	Settling and removal of tertiary suspended solids
	Tag No	M-08 & M-08A
	MOC	MSEP
	Quantity	1 Nos.
	Capacity	17 M3/Hr.
	Speed	0.08 rpm
	Type	Central Drive with Rake Arm Mechanism
	Prime Mover	Geared Motor
	Motor	0.5 HP

18.	**PSF FEED PUMP (P – 08A/B) –**	
	Application	Pressure Sand Filter Feed Pumps
	Tag No	P-08 A/B
	Capacity	20 M3/Hr.
	MOC	CI
	Quantity	2 (1W +1S)
	Type	Centrifugal Self-Priming
	Motor	5 HP
19.	**PRESSURE SAND FILTER (PSF – 01) –**	
	Application	Removal of turbidity from treated water
	Tag No	PSF – 01
	Filter Media	Fine Sand, Pebbles & Anthracite
	Capacity	17 M3/Hr.
	MOC	MS fabricated
	Quantity	1 Nos.
	Type	Vertical Cylindrical Multi-Grade Filter
	Design Pressure	6 kg/cm2
20.	**ACTIVATED CARBON FILTER (PSF – 01) –**	
	Application	Removal of residual COD &Color from treated water
	Tag No	ACF – 01
	Filter Media	Activated Carbon
	Capacity	17 M3/Hr.
	MOC	MS fabricated
	Quantity	1 Nos.
	Type	Vertical Cylindrical Multi Grade Filter
	Design Pressure	6 kg/cm2

21.	**SLUDGE THICKENER (M–10) –**	
	Application	Thickening of Clarifiers Under-Flow to 2-5% solids
	Tag No	M-10
	MOC	MSEP
	Quantity	1
	Capacity	5 m3/hr
	Type	Central drive with bottom bearing & pickets
	Prime Mover	Geared Motor
	Motor	0.5 HP

6. LIST OF INSTRUMENTS			
S.No	**ITEM NAME**	**TAG NO**	**QUANTITY**
1	Level Switch with Alarm	LS - 01A/B, 02, 03, 04, 05, 06	6 Nos.
2	pH Indicator & Controller	pHIC – 01	1 Nos.
3	DO Analyzer	DOA – 01, 02	2 Nos.
4	Magnetic Flow Meter with Totalizer	FM – 01, 02	4 Nos
5	Glass tube Rotameters	FM – 03	1 Nos.
6	Pressure Gauges	PI – 01 to PI – 17	17 Nos.
7	Temperature Indicator	TI – 01 , 02	2 Nos.

1.	**LEVEL SWITCH WITH ALARM (LS – 01, 02, 03, 04, 05, 06) –**	
	Application	To operate pumps ON/OFF automatically based on liquid level
	Tag No	LS - 01A/B, 02, 03, 04, 05, 06
	MOC	PP / PTFE lined
	Quantity	6 Nos.
	Range	0.5 – 6 Mtr. Liq. Depth
	Type	Float type
	Location	Mounted on RCC open tanks
2.	**pH INDICATOR & CONTROLLER (pHIC – 01) –**	
	Application	Automatic pH correction in Neutralization Tank (T-02A)
	Tag No	pHIC – 01
	MOC	PTFE / Glass Electrode
	Quantity	1No.
	Range	0 - 14pH
	Type	Dip type glass electrode
	Location	Neutralization tank (T-02A)
3.	**DO ANALYSER (DOA – 01, 02) –**	
	Application	Maintain optimum Dissolved Oxygen in Aeration Tanks
	Tag No	DOA – 01, 02
	MOC	PTFE
	Quantity	2 Nos.
	Range	0 – 20 ppm Dissolved Oxygen
	Type	Dip type Ampereometric Sensor
	Location	Bio-Reactors – I & II (T-04)

4.	**MAGNETIC FLOW METER & TOTALIZER (FM – 01, 02) –**	
	Application	To determine flow of effluent
	Tag No	FM – 01 , 02
	MOC	SS / PTFE
	Quantity	1No.
	Range	0 – 30 M3/Hr.
	Type	Magnetic Flow Meter
	Location	Effluent transfer pumps discharge.
5.	**GLASS TUBE ROTAMETER (FM – 03) –**	
	Application	To determine flow of effluent
	Tag No	FM – 03
	MOC	Glass tube / PTFE float
	Quantity	1Nos.
	Range	0 – 16 M3/Hr.
	Type	Glass Tube Rotameter
	Location	Effluent transfer pumps discharge.
6.	**PRESSURE GAUGES (PI – 01 TO 17) –**	
	Application	To determine pressure in piping system
	Tag No	PI – 01 to 17
	MOC	AISI 316L
	Quantity	17 Nos.
	Range	0 – 6 kg/cm2
	Type	Bourdon type Pressure Gauge with Heavy Duty Diaphragm Seal
	Location	Pump & Blower discharge.

7. UTILITIES AND CHEMICAL CONSUMPTION		
	Utilities and consumables for Operation & Maintenance :	
1.	Power Consumption –	
	a.Connected Load	73.5 kW
	b.Absorbed Power	56 bkW
	c.Power Consumption	1344 kWh/day
2.	Chemical Consumption –	
	a.PAC (HPS Pre-Treatment & Tertiary Treatment)	87.5 kg/day
	b.Poly-electrolyte (HPS & Tertiary)	2 kg/day
3.	Seed sludge & Jaggery (For commissioning Only) –	
	a.Seed Sludge	120 m3 (As 2% MLSS conc. From Municipal STP)
I	b.Waste Jaggery / Methanol	25 kg/Day

MULTIPLE EFFECT EVAPORATOR

The evaporating plant will comprise the following equipment:

BALANCE TANK

Quantity	:	1 No.
Capacity	:	1000 L
MOC	:	SS 316

It will be fitted with feed inlet and outlet connection. It will be provided with High Level and Low Level Switches.

DUPLEX FILTER (TWIN)

Quantity	:	1 Set
MOC	:	SS 316

This will filter the liquor to remove the foreign suspended particles. This will be fitted in line with the balance tank and evaporator. It will be complete with necessary valves and fittings.

FEED PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. working + 1 No. installed standby)
MOC	:	Liquid Contact Parts—SS 316
Type	:	Centrifugal with double mechanical seal

This is a centrifugal pump with sanitary design and SS mechanical shaft seal capable of pumping the required feed rate. The pump will have sealing arrangement and will be coupled to an electric motor . The pump will be complete with SS shroud and SS inlet/outlet ending in SS union of DIN standard.

PRE-HEATERS

Type	:	Straight tube/shell & tube type	
Orientation	:	Vertical	
Quantity	:	1 Set	
MOC	:	Tubes	: Titanium Gr. II Seamless (OD: 38.1 mm, Thk. 1.0 mm)
		Tube Sheet	: SS 316
		Shell	: SS 304
Length	:	7.5 / 10 m	

It will be of shell & tube/straight tube type for heating the feed upto boiling point by means of vapour from all effects of the plant.

CALANDRIAS

Quantity	: 5 Nos. (2 Nos. Falling Film Type + 3 Nos. Forced Circulation Type)	
Orientation	: Vertical	
MOC	: Tubes	: Titanium Gr. II Seamless (For Falling Film Type Tube OD: 50.8 mm & Forced Circulation Type Tube OD: 31.75 mm, Thk. 1.0 mm)
	Tube Sheet	: SS 316, with Ti explosion bonding
	Shell	: SS 304
No. of passes:	1	
Length	: 7.5 / 10 m	

Falling Film Type Calandria will have bunch of tubes welded or expanded to the tube plates in a vertical shell and provided with efficient distribution assembly on top for even distribution of feed over the tubes for falling film calandria. The bottom of the calandria will be made as a container to receive the concentrate and a connection for vapour duct leading to vapour separator.

Forced Circulation Type Calandria is shell and tube type vertically arranged heat exchanger. Preheated feed is pumped by recirculation pump through the bottom of the calandria tubes with high velocity from down to upward in case of forced circulation calandria. Dry saturated steam/vapour is supplied as heating medium in the jacket which causes heating of feed through the tubes.

Calandrias will be provided with quick detachable top cover for visual inspection/manual cleaning, a sight glass (fitted with toughened glass) at the bottom of the jacket to monitor the condensate level and necessary connections for steam vapour condensate, non-condensable, air vent, product inlet, concentrate outlet, etc.

The first & second effect calandrias will be insulated with mineral wool/rock wool mates of thickness 50 mm and it will be cladded with Al. sheet. Calandrias for other effects will, generally, be designed according to the calandrias for the preceding effects but excluding insulation and cladding.

VAPOUR SEPARATORS

Quantity	:	5 Nos. (2 Nos. Falling Film Type + 3 Nos. Forced Circulation type)
MOC	:	SS 316

Description	Thk.
1st effect Vapour Separator	5 mm
2nd effect Vapour Separator	
3rd effect Vapour Separator	
4th effect Vapour Separator	6 mm
5th effect Vapour Separator	

Vapour separators, separate the vapour from concentrate and normally placed in front of the calandrias. These are connected to receiver bottom of the calandrias with a tangential inlet (for falling film type calandrias) and connected to Calandria top with a tangential inlet (for forced circulation type calandrias) with a central top outlet vapour duct. The separator will be complete with the following fittings and accessories:

- 1 No. SS quick openable man-way/hand hole located on the vertical portion of the shell.
- 1 No. Sight glass.
- 1 No. Light glass.
- 1 Set connection for temperature sensors and vacuum gauge.
- 1 No. SS Concentrate outlet at the bottom, ending in SS union.

THERMAL VAPOUR RE-COMPRESSOR (TVR)

Quantity	:	1 Set
MOC	:	SS 304

Thermal vapour re-compressor will have steam nozzles of stainless steel, will be insulated and covered with Al. sheet. The re-compressor will have a pressure gauge located at the steam inlet.

CONDENSER

Quantity	:	1 No.		
Type	:	Surface type (Shell and Tube)		
Orientation	:	Vertical		
Capacity	:	Matching to Plant		
MOC	:	Tubes	:	SS 304
		Tube Sheet	:	SS 304
		Shell	:	SS 304

This will have a bunch of SS tubes mounted in a vertical shell. This can be of four passes. The water is circulated in the tubes and vapour gets condensed on the shell side. The condenser will be complete with following fittings and accessories:

- Water inlet and outlet connection with matching flanges
- 1 No. Sight glass.

CONCENTRATE PUMPS WITH MOTORS (FOR FALLING FILM EFFECTS)

Quantity	:	4 Nos. (2 Nos. Working + 2 Nos. Installed Standby)
Type	:	Centrifugal
MOC	:	Liquid Contact Parts—SS 316

These pumps will have adequate capacity to pump the feed through the calandrias and its separators to the next effect. The pumps will be supplied with suitable horsepower rating motors.

RECIRCULATION PUMPS WITH MOTORS (FOR FORCED CIRCULTION EFFECTS)

Quantity	:	5 Nos. *a. 3 Nos. Working* *b. 1 No. common store standby pump for 3rd& 4th pumps* *c. 1 No. store standby pump for last pump*
Type	:	Axial Flow Type
MOC	:	Liquid Contact Parts—SS 316
Head	:	2.5 m LC

These pumps are to re-circulate the liquid from the bottom of forced circulation type Calandria. The pumps will have adequate capacity to pump the feed through the Calandrias and its separators. The pumps will be supplied with suitable horsepower rating motors.

The pumps will have sealing arrangement and will be coupled to an electric motor of suitable horsepower rating. The pumps will be complete with SS shroud and SS inlet/outlet connections.

CONCENTRATE DISCHARGE PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. working + 1 No. installed standby)
MOC	:	Liquid Contact Parts—SS 316
Type	:	Centrifugal with double mechanical seal

The pumps will have adequate capacity to extract the final concentrated product from last effect.
The pumps will be supplied with suitable horsepower rating motor.

CONDENSATE PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. working + 1 No. installed standby)
MOC	:	Liquid Contact Parts—SS 304
Type	:	Centrifugal with double mechanical seal

Extracting out condensate from all effects through condenser. The discharge pressure at the outlet of Pump will be 2 Bar-g.

VACUUM PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. working + 1 No. installed standby)
Type	:	Liquid Ring Water Sealed
MOC	:	Casing : CI with SS sleeves
		Cover : CI
		Rotor : SS 304

This will be of liquid ring water sealed type coupled to an electric motor of suitable rating through a flexible coupling. The pumps will have sufficient capacity to achieve the required vacuum in the plant.

VAPOUR DUCT

Quantity	:	1 Set
MOC	:	SS 304

This will be made of suitable thickness for interconnecting Calandrias, vapour separators and condenser.

INTER CONNECTING PIPES AND FITTINGS

Quantity	:	1 Lot
MOC	:	Product Piping—SS 316
		Condensate Line—SS 304
		Air Line—SS 304
		Steam Line—Carbon Steel (ASTM A106 Gr. B)
All Piping	:	
		Below 200 NB: Sch. 40
		Above 200 NB: Sch. 10
All Flanges	:	PN6

Complete with necessary pipes, union, bends, tees, valves, pipe supports etc. for interconnecting various components of the plant based on a compact layout.

SALT SEPARATION SECTION

HYDROCYCLONE

Capacity	:	Suitable
MOC	:	SS 316
Quantity	:	1 No.

Hydro cyclone will be supplied to thicken the concentrate a little before finally entering into the thickener.

THICKENER

Capacity	:	10 m^3
MOC	:	SS 316
Quantity	:	1 No.

Specially designed Thickener to separate slurry from the liquid coming out from the Hydrocyclone.
It will have product inlet and outlet connection, with valve and overflow line.

MOTHER LIQUOR COLLECTION TANK

Quantity	:	1 No.
MOC	:	SS 316
Capacity	:	10 KL

This is provided for intermediate holding of mother liquor before being pumped to the Forced Circulation Evaporator.

MOTHER LIQUOR RECIRCULATION PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. Working + 1 No. Installed Standby)
MOC	:	Liquid Contact Parts—SS 316
Type	:	Centrifugal

The pump will have adequate capacity to pump/recirculate the mother liquor from the centrifuge to the evaporator.
The pump will be supplied with suitable horsepower rating motor.

Supply includes interconnecting piping also.

PUSHER CENTRIFUGE

Capacity : Up to 2.5 TPH

MACHINE TYPE	CONTINUOUS PUSHER CENTRIFUGE (MECHANICAL)
CAPACITY	Up to 2.5 TPH
OPERATING SPEED	2000 RPM
MAXIMUM SPEED	2138 RPM
SLOTTED SCREENS	Corima Design, Screen Profile 34 S.b.b. slot width 0.2+/-.05mm (As per particle size distribution of material to be processed)
BEARING HOUSE	Welded Construction, machined, covered

	with belt guard and hydraulic oil sump. Painted.
PROCESS HOUSE	Welded Construction, machined, polished smooth.
MOTOR DETAILS (NON FLAME PROOF) Motor Make : ABB/Siemens	DRIVE MOTOR: 25 H.P., 1500 rpm, 440 V, 50 cycles Frame B 3, Mechanical Protection Type IP 55, and Non-Flame proof Drive thru. 4-goove V-Belt Pulleys. PUSHER MOTOR: 15 H.P. 1500 rpm, 440 V, 50 cycles. Frame size B 3, Mechanical protection Type 55, Non-flame proof Drive.
LUBRICATION	Bearings are grease lubricated.
ACCESSORIES	Vibration Switch in non-flameproof enclosure is provided.

MATERIAL OF CONSTRUCTION

ALL WETTED PARTS IN S.S. 316

BASKETS	S.S. 316
PUSHER PLATE	S.S. 316
PUSHER RING	S.S. 316
SLOTTED SCREENS	S.S. 316 (MILLED CONSTRUCTION)
FEED ACCELERATOR	S.S. 316
FEED CONE	S.S. 316
PUSHER SHAFT	EN-19, heat-treated
MAIN SHAFT	ST – 52
BEARING HOUSE	CARBON STEEL
PROCESS HOUSE	S.S. 316
VOLUTE RACE	S.S. 316
SCRAPPER BLADES	S.S. 316
FEED PIPE	S.S. 316
WASH AND RINSE PIPES	S.S. 316
FLAT SEALS	VITON
ROUND SEAL RINGS	VITON
RADIAL SHAFT SEALING RINGS	VITON / PTFE
SEALING DISCS	PTFE, 15 % GRAPHITED

NORMAL CONSUMPTION FOR SALT SEPARATION SECTION : 20 HP

TOLERANCE:

ALL CONSUMPTION FIGURE WITHIN ±10%

NOTE: ALL MOTORS CONSIDERED ARE FLAMEPROOF TYPE.

VERTICAL THIN FILM DRYER
QUANTITY = 2 SETS

The inner shell will have a scrapper for scrapping the product over the inner shell in order to get a thin uniform film, which is driven by electrical geared motor. This will be jacketed, insulated and cladded with Al. sheet.

The Vertical Thin Film Dryer equipped with following items:

BALANCE TANK FOR FEED

Capacity	:	500 L (excluding conical part)
Quantity	:	1 No. (For Each Set of VTFD)
MOC	:	SS 316
Type	:	Cylindrical with conical bottom

It is equipped with agitator and gearbox assembly.

FEED PUMP WITH MOTOR

Capacity	:	Suitable
MOC	:	SS 316
Quantity	:	2 Nos. (1 No. Working + 1 No. installed standby) (For Each Set of VTFD)
Type	:	Centrifugal

This will have adequate capacity to pump the feed to the dryer.

FEED PRE-HEATER

Type	:	Straight tube type	
Quantity	:	1 Set (For Each Set of VTFD)	
MOC	:	Tubes	: Titanium Gr. II Seamless
		Tube Sheet	: SS 316
		Shell	: SS 304

It will be of straight tube type for pre-heating the feed by means of vapour from dryer.

VERTICAL THIN FILM DRYER (HEAT EXCHANGER)

Quantity	:	1 No. (For Each Set of VTFD)		
Capacity	:	881 kg/h Max. Water Evaporation (For Each Dryer) 1762 kg/h Max. Water Evaporation (Combined for 2 Dryers)		
MOC	:	Product Contact Parts	:	SS 316
		Jacket	:	Carbon Steel (IS:2062)
HTA	:	25 m^2 for Each set of VTFD		

The inner shell will have scrapper for scrapping the product over inner shell in order to get a thin uniform film, which is driven by electrical geared motor with motor. This will be jacketed, insulated and cladded with Al. sheet.

ID FAN WITH MOTOR

Quantity	:	2 Nos. (1 No. Working + 1 No. installed standby) (For Each Set of VTFD)
Fan MOC	:	SS 316, vapour contact parts

For suction of non-condensable gases through the condenser. The unit will be complete with totally closed fan cooled motor and V-belt drive with safety guard. The fan will be of centrifugal type with statically and dynamically balanced impeller and mounted on a shaft supported by ball bearings. The housing will be provided with an inspection door and a drain. The fan and motor will be assembled on a common base frame.

CONDENSER

Quantity	:	1 No. (For Each Set of VTFD)	
Type	:	Surface Type (Shell and Tube)	
Capacity	:	As per specified evaporation rate	
MOC	:	Tubes	: SS 304
		Tube sheet	: SS 304
		Shell	: SS 304

This will have a bunch of SS tubes mounted in a vertical shell. This can be of multi- passes. The water is circulated in the tubes and vapour gets condensed on the shell side. The condenser will be complete with following fittings and accessories:

- Water inlet and outlet connection with matching flanges
- 1 No. Sight glass

CONDENSATE RECEIVING TANK

Quantity	:	1 No. (For Each Set of VTFD)
MOC	:	SS 304
Capacity	:	50 L

CONDENSATE PUMP WITH MOTOR

Quantity	:	2 Nos. (1 No. Working + 1 No. installed standby) (For Each Set of VTFD)
MOC	:	Liquid Contact Parts—SS 304
Type	:	Centrifugal

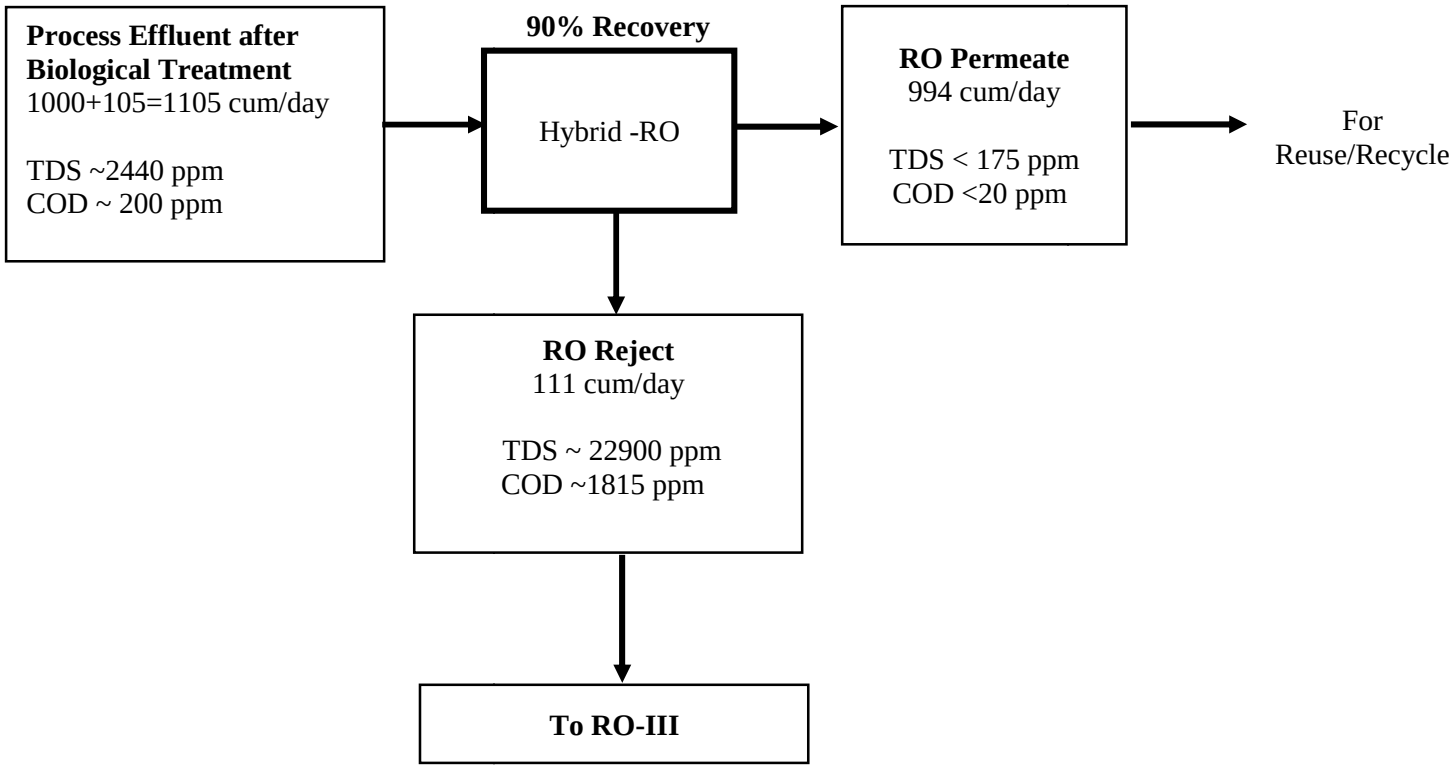
For extracting out the condensate from the condensate receiving tank. The discharge pressure at the outlet of Pump will be 2 Bar-g.

INTER CONNECTING PIPES & FITTINGS

Quantity	:	1 Lot (For Each Set of VTFD)
MOC	:	Product Piping— SS 316 Condensate Line—SS 304 Air Line—SS 304 Steam Line—Carbon Steel (ASTM A106 Gr. B)
All Piping	:	Below 200 NB: Sch. 40 Above 200 NB: Sch. 10
All Flanges	:	PN6

PLANT I:

ROCHEM Hybrid-RO Membrane System for Effluent Treatment/Recycle.
Capacity 1105 cum/day @ 20Hrs.Operation



PERFORMANCE CHART FOR INLET TDS VS PERMEATE TDS:

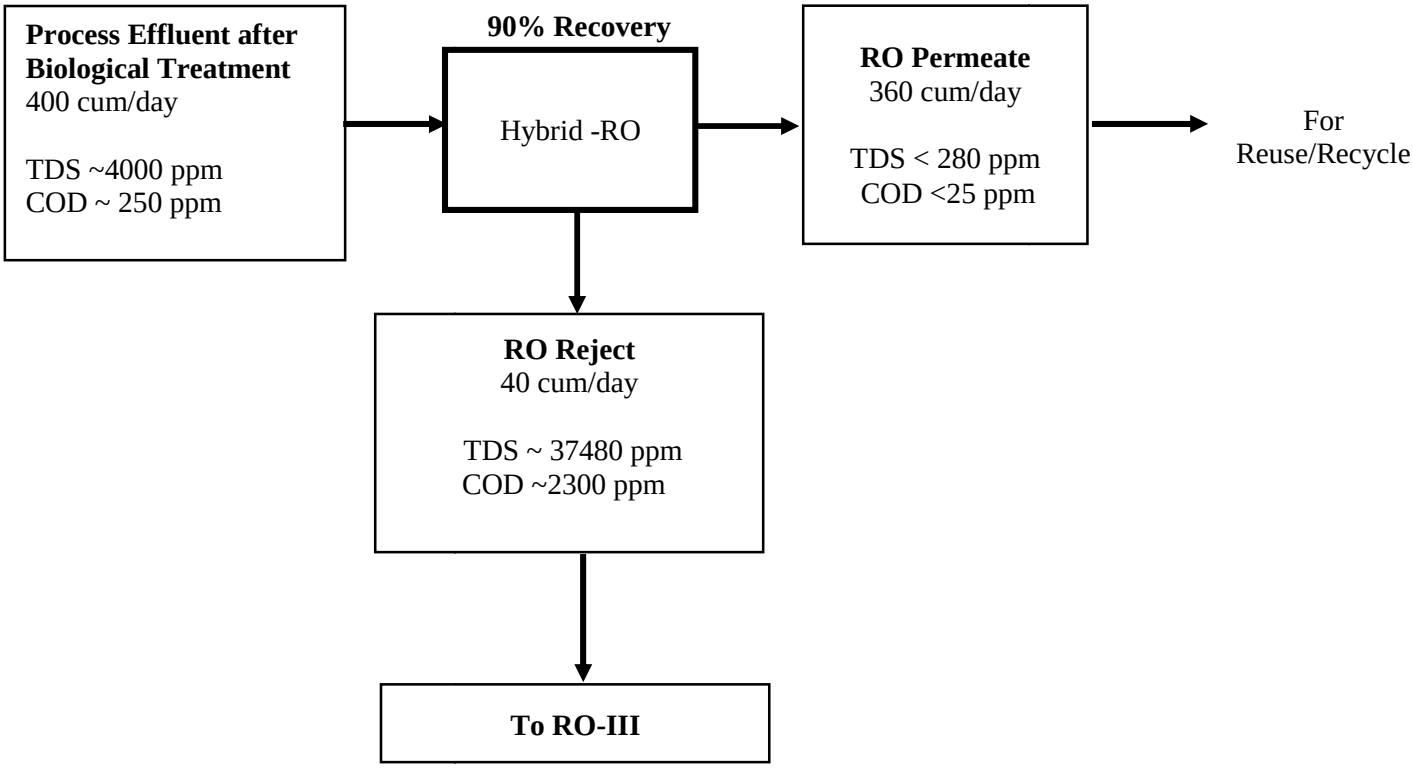
Sr.No	INLET TDS PPM	PERMEATE TDS PPM
1.	2500	200
2.	4000	300
3.	5000	350

PERFORMANCE CHART FOR INLET COD VS RECOVERY PERCENTAGE:

Sr.No	INLET COD PPM	RECOVERY
1.	250	90%
2.	500	85%
3.	1000	79%

PLANT II:

ROCHEM Hybrid-RO Membrane System for Effluent Treatment/Recycle.
Capacity 400 cum/day @ 20Hrs.Operation



PERFORMANCE CHART FOR INLET TDS VS PERMEATE TDS:

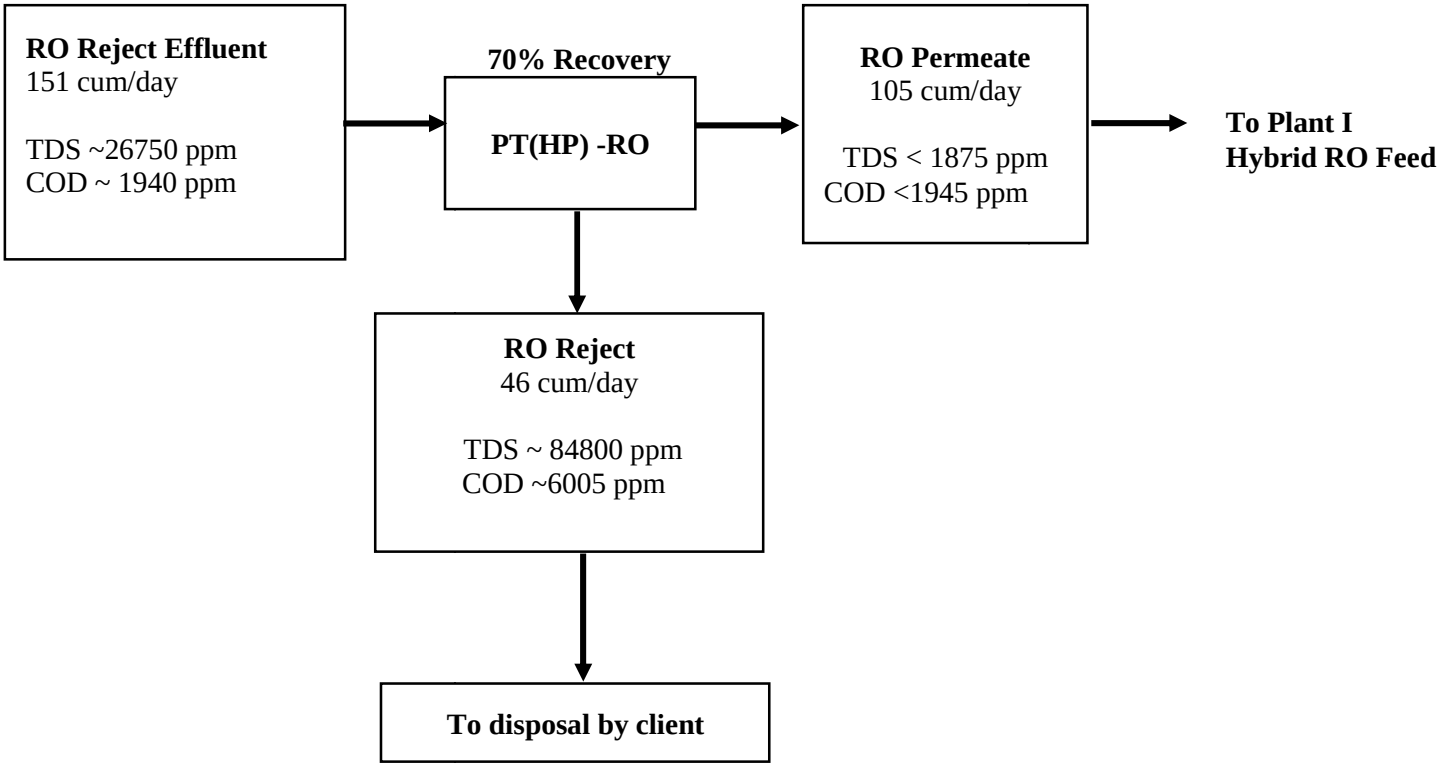
Sr.No	INLET TDS PPM	PERMEATE TDS PPM
1.	2500	200
2.	4000	300
3.	5000	350

PERFORMANCE CHART FOR INLET COD VS RECOVERY PERCENTAGE:

Sr.No	INLET COD PPM	RECOVERY
1.	250	90%
2.	1000	82%
3.	2500	73%

PLANT III:

ROCHEM PT(HP) -RO Membrane System for RO Reject Effluent Treatment/Recycle. Capacity 151 cum/day @ 20Hrs.Operation



ROCHEM RO MEMBRANE SYSTEM FOR EFFLUENT TREATMENT/RECYCLE.
(Micro Processor controlled, semi-automatic, Fully Fail safe and unattended Operation)

PLANT 1:

Hybrid-RO-System		
Input Effluent to Hybrid-RO System	**:**	**Treated Sewage + PT(HP) RO Permeate at Ph 6.0-6.5 max (Ph correction by HCL by Client)**
Input Effluent Capacity	**:**	**1000 +105=1105 cum/day**
RO Input Effluent quality TDS COD	: 	 2400 ppm max 200 ppm max
RO Permeate Capacity	**:**	**994 cum/day**
RO Permeate Capacity TDS COD	: 	Colourless 175 ppm max 20 ppm max
Recovery RO Permeate	:	**90 %**

ROCHEM RO MEMBRANE SYSTEM FOR EFFLUENT TREATMENT/RECYCLE.
(Micro Processor controlled, semi-automatic, Fully Fail safe and unattended Operation)

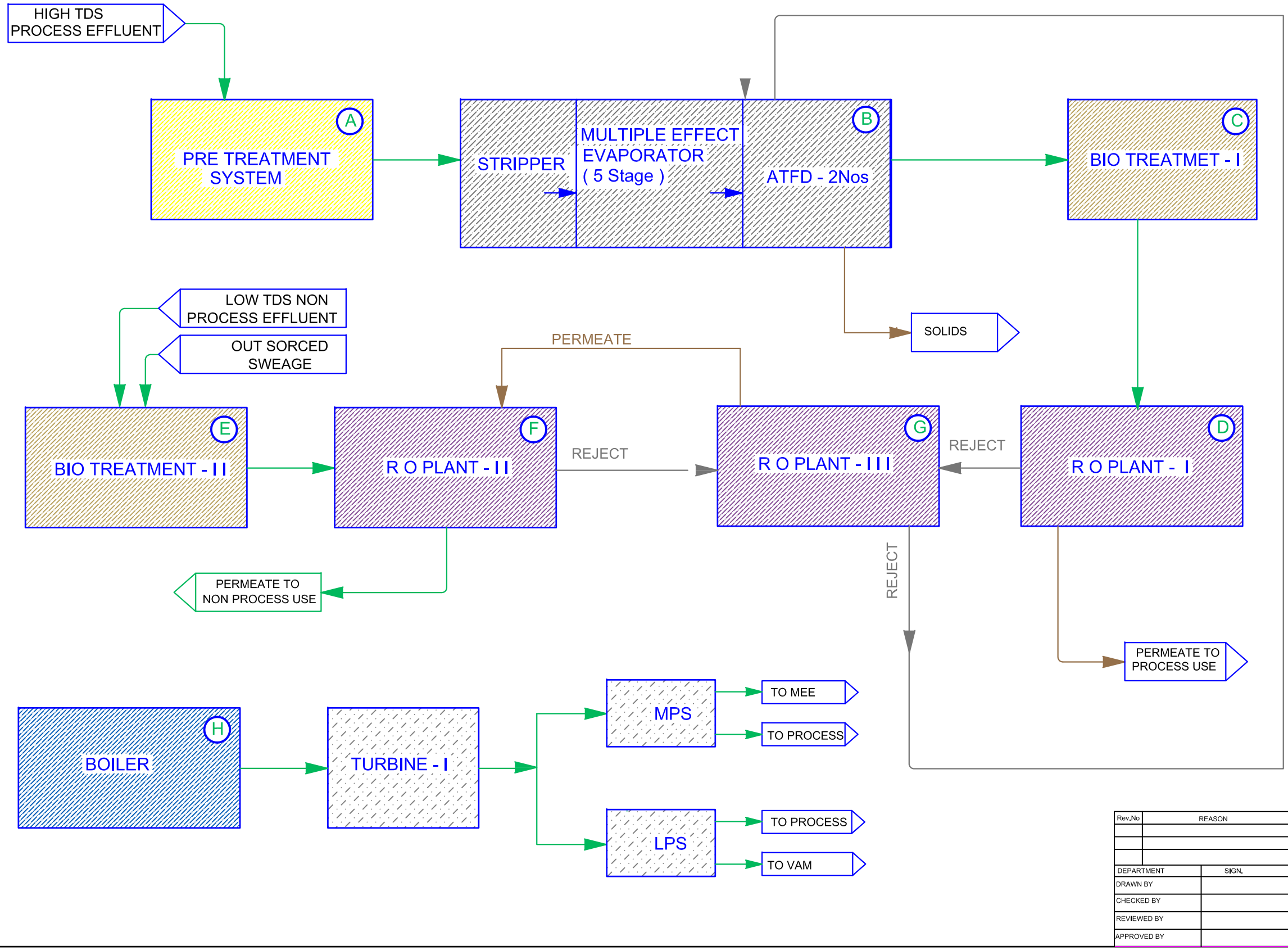
PLANT II:

Hybrid-RO-System		
Input Effluent to Hybrid-RO System	**:**	**Process Effluent after Biological Treatment at pH6.0-6.5 max (pH correction by HCL by Client)**
Input Effluent Capacity	**:**	**400 cum/day**
RO Input Effluent quality TDS COD	: :	 4000 ppm max 250 ppm max
RO Permeate Capacity	**:**	**360 cum/day**
RO Permeate Capacity TDS COD	: 	Colourless 280 ppm max 25 ppm max
Recovery RO Permeate	:	**90 %**

ROCHEM RO MEMBRANE SYSTEM FOR EFFLUENT TREATMENT/RECYCLE.
(Micro Processor controlled, semi-automatic, Fully Fail safe and unattended Operation)

PLANT III:

PT(HP)-RO-System		
Input Effluent to PT(HP)-RO System	**:**	**RO Reject Effluent at pH6.0-6.5 max** **(pH correction by HCL by Client)**
Input Effluent Capacity	**:**	**151 cum/day**
RO Input Effluent quality TDS COD	: 	 26750 ppm max 1940 ppm max
RO Permeate Capacity	**:**	**105 cum/day**
RO Permeate Capacity TDS COD	: 	Colourless 1875 ppm max 195 ppm max
Recovery RO Permeate	:	**70 %**



NAME	DESIGN PARAMETERS (INLET)						
	FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)	BOD (PPM)	AMONICAL NITROGEN
HIGH TDS PRE TREATMENT	350	3 - 12	~ 121000	3000(Max)	35000	-	N /A
MUTIPLE EFFECT EVAPORATOR	400	7 - 8	10 %	-	-	-	N /A
AGITATED THIN FILM DRYER	97	7 - 8		35 %	-	-	N /A
BIO TREATMENT - I	400	5 - 9	< 6000	< 100	< 6000	2000	N /A
BIO TREATMENT - II	1000	6 - 8	< 6000	400	< 4000	< 2000	<100
R.O PLANT - I	1105	6 - 6.5	2440 (Max)		200 (Max)		-
R.O PLANT - II	400	6 - 6.4	4000 (Max)	-	250 (Max)	-	-
R.O PLANT - III	151	6 - 6.5	26750 (Max)	-	1940 (Max)	-	-

NAME	DESIGN PARAMETERS (OUTLET)						
	TREATED (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)	BOD (PPM)	AMONICAL NITROGEN
HIGH TDS PRE TREATMENT	350	6.5 - 8.5	~ 121000	< 100	35000	-	N /A
MUTIPLE EFFECT EVAPORATOR	290	7 - 8	10 %	-	-	-	N /A
AGITATED THIN FILM DRYER	97	7 - 8		35 %	-	-	N /A
BIO TREATMENT - I	400	6.5 - 8.5	< 6000	< 100	< 250	< 30	N /A
BIO TREATMENT - II	1000	6.5 - 8.5	< 6000	< 100	< 250	< 30	< 50
R.O PLANT - I	994	-	175 (Max)	-	20 (Max)	-	-
R.O PLANT - II	360	-	280 (Max)	-	25 (Max)	-	-
R.O PLANT - III	105	-	1875 (Max)	-	195 (Max)	-	-

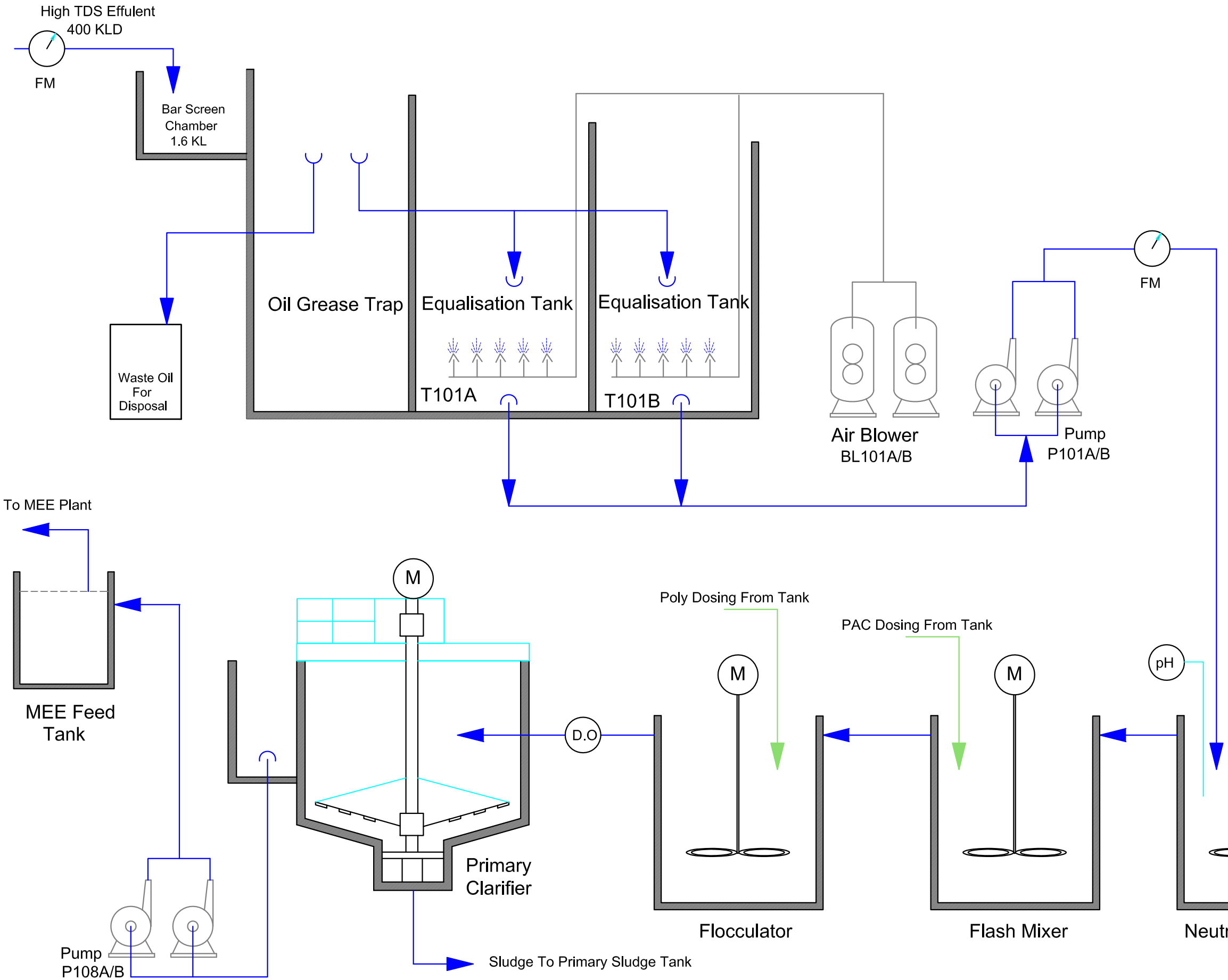
Rev.No	REASON	DATE

DEPARTMENT	SIGN.	DATE
DRAWN BY		
CHECKED BY		
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF ZLD SYSTEM

FILE NAME	D: \ ZLD FLOW	REV.NO
DRAWING.NO.	SSL/P/LO-9766/IB/15/16	15



Tag.No.	Eq.Name	MOC	KL	HP
T101A T101B	Equalization Tank	RCC	150 (Each)	
T102A	Neutralization Tank	RCC	3.1	
T102B	Flash Mixer	RCC	3.1	
T102C	Flocculator	RCC	3.1	
T103	Primary Clarifier	RCC	50	
T111	MEE Feed Tank	RCC	150	
DP101	Dosing Pump	PP	40 LPH	
DP102	Dosing Pump	PP	40 LPH	
DP103	Dosing Pump	PP	40 LPH	
P101A	Feed Pump	SS304	17 KL/H	
P101B	Feed Pump	SS304	17 KL/H	
P108A	Transfer Pump	C.I	17 KL/H	
P108B	Transfer Pump	C.I	17 KL/H	
BL101A	Air Blower	C.I	300 KL/H	
BL101A	Air Blower	C.I	300 KL/H	
S201	Bar Screen	RCC	1.6 KL	

DESIGN PARAMETERS (INLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
350	3 - 12	~ 121000	3000(Max)	35000

DESIGN PARAMETERS (OUTLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
350	6.5 - 8.5	~ 121000	< 100	35000

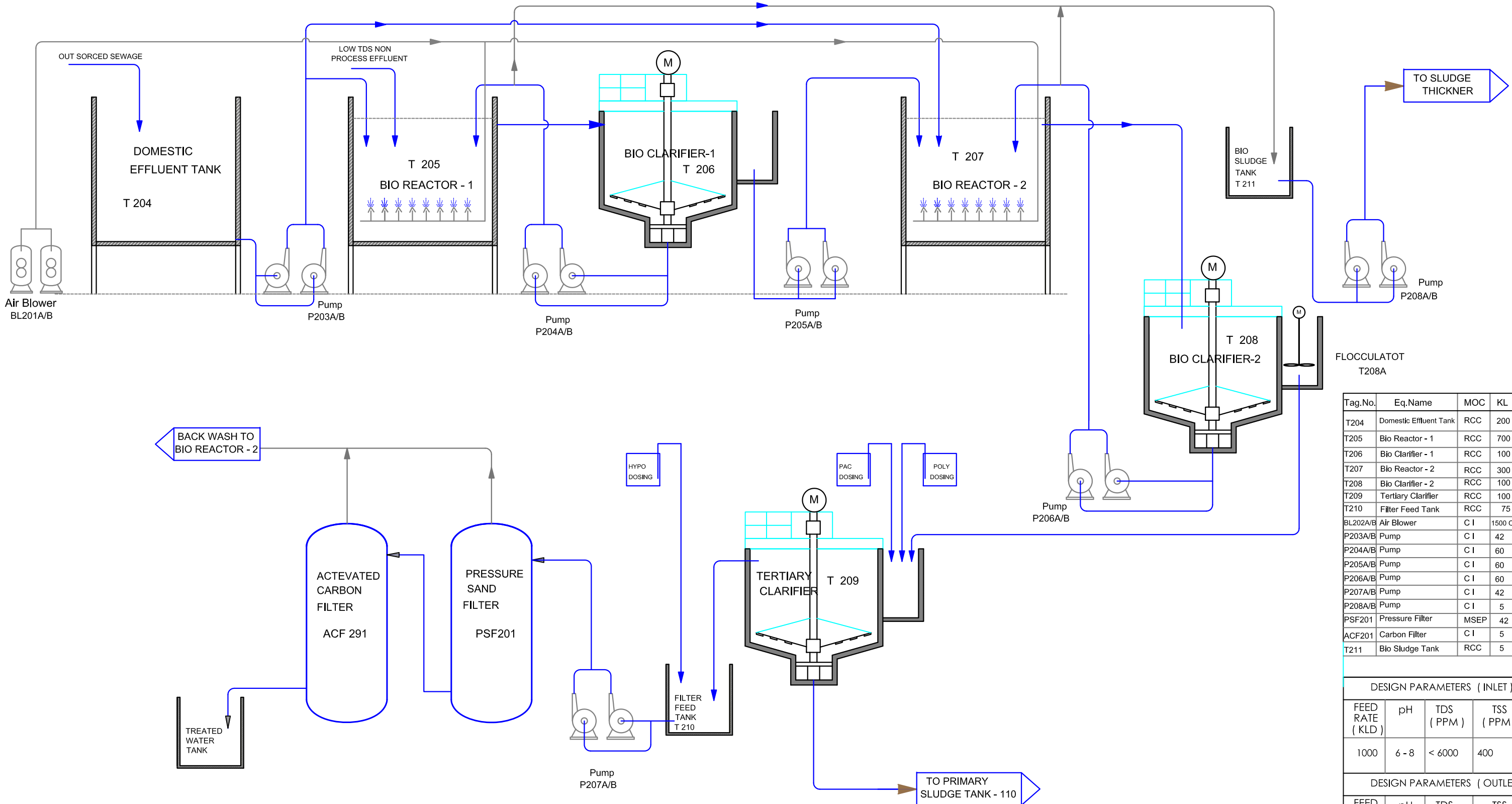
Rev.No	REASON	DATE

DEPARTMENT	SIGN.	DATE
DRAWN BY		
CHECKED BY		
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF HIGH TDS
PRE TREATMENT SYSTEM (400 KLD)

FILE NAME	D: \ ZLD FLOW	REV.NO
DRAWING.NO.	SSL/P/LO-9767/ZD/00/16	00



Tag.No.	Eq.Name	MOC	KL	H
T204	Domestic Effluent Tank	RCC	200	
T205	Bio Reactor - 1	RCC	700	
T206	Bio Clarifier - 1	RCC	100	
T207	Bio Reactor - 2	RCC	300	
T208	Bio Clarifier - 2	RCC	100	
T209	Tertiary Clarifier	RCC	100	
T210	Filter Feed Tank	RCC	75	
BL202A/B	Air Blower	C I	1500 Cu.M/H	
P203A/B	Pump	C I	42 KL/H	
P204A/B	Pump	C I	60 KL/H	
P205A/B	Pump	C I	60 KL/H	
P206A/B	Pump	C I	60 KL/H	
P207A/B	Pump	C I	42 KL/H	
P208A/B	Pump	C I	5 KL/H	
PSF201	Pressure Filter	MSEP	42 KL/H	
ACF201	Carbon Filter	C I	5 KL/H	
T211	Bio Sludge Tank	RCC	5 25	

DESIGN PARAMETERS (INLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
1000	6 - 8	< 6000	400	< 4000

DESIGN PARAMETERS (OUTLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
1000	6.5 - 8.5	< 6000	< 100	< 250

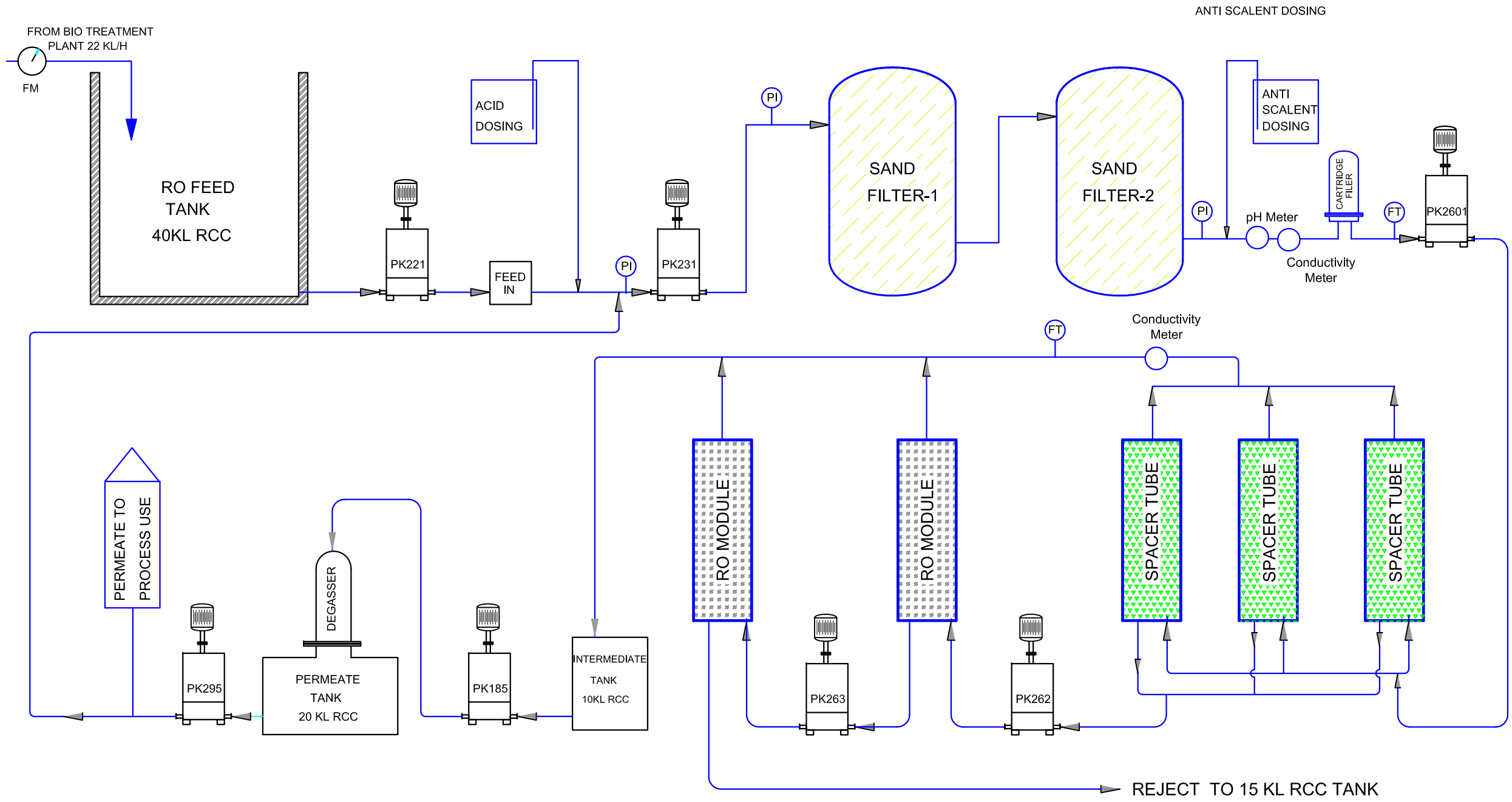
Rev.No	REASON	DATE

DEPARTMENT	SIGN.	DATE
DRAWN BY		
CHECKED BY		
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF LOW TDS BIO TREATMENT SYSTEM - II (1150 KLD)

FILE NAME	D:\ ZLD FLOW	REV.NO
DRAWING NO.	SSL/P/LO-9771/ZD/00/16	00



Tag.No.	Eq.Name	MOC	KL	HP
x	RO Feed Tank	RCC	50	
PK221	Pre Filter Pump	SS	22 KL/H	
PK231	Pre Filter Pump	SS	-	
FS 230	Sand Filter - 1	FRP	-	
FS 231	Sand Filter - 2	FRP	-	
PK2601	High Pressure Pump	SS	20 KL/H	
PK262	Booster Pump	SS	15.2 KL/H	
PK263	Booster Pump	SS	15.2 KL/H	
x	Intermediate Tank	RCC	10 KL	
PK185	Intermediate Pump	SS	18 KL/H	
x	Permeate Tank	RCC	20 KL	
PK185	Intermediate Pump	SS	20 KL/H	
x	Spacer Tube - 3 Nos		400 KLD	
x	RO Module - 2 Nos		400 KLD	

DESIGN PARAMETERS (INLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
400	6 - 6.4	4000(Max)	–	250

DESIGN PARAMETERS (OUTLET)

Treated (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
360		280(Max)		25

Rev.No	REASON	DATE

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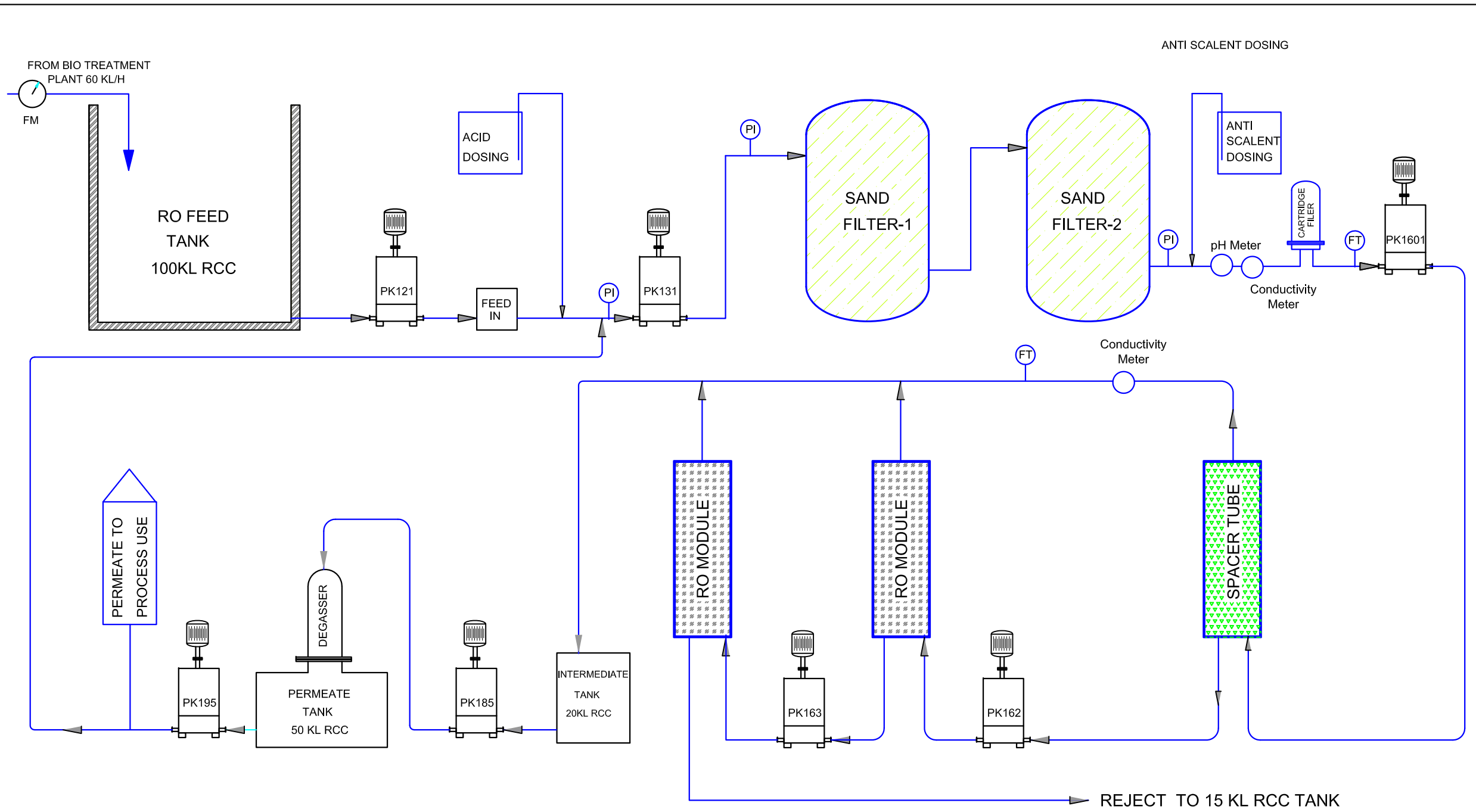
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF RO PLANT - I
(400 KLD)

FILE NAME	D: \ ZLD FLOW	REV.NO
DRAWING.NO.	SSL/P/LO-9768/ZD/00/16	00



Tag.No.	Eq.Name	MOC	KL	HP
x	RO Feed Tank	RCC	100	
PK121	Pre Filter Pump	SS	60 KL/H	
PK131	Pre Filter Pump	SS	-	
FS 130	Sand Filter - 1	FRP	-	
FS 131	Sand Filter - 2	FRP	-	
PK1601	High Pressure Pump	SS	55 KL/H	
PK162	Booster Pump	SS	35 KL/H	
PK163	Booster Pump	SS	35 KL/H	
x	Intermediate Tank	RCC	20 KL	
PK185	Intermediate Pump	SS	49 KL/H	
x	Permeate Tank	RCC	50 KL	
PK185	Intermediate Pump	SS	55 KL/H	
x	Spacer Tube - 3 Nos		1105 KLD	
x	RO Module - 2 Nos		1105 KLD	

DESIGN PARAMETERS (INLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
1105	6 - 6.5	2440(Max)		200

DESIGN PARAMETERS (OUTLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
994		175(Max)		20)

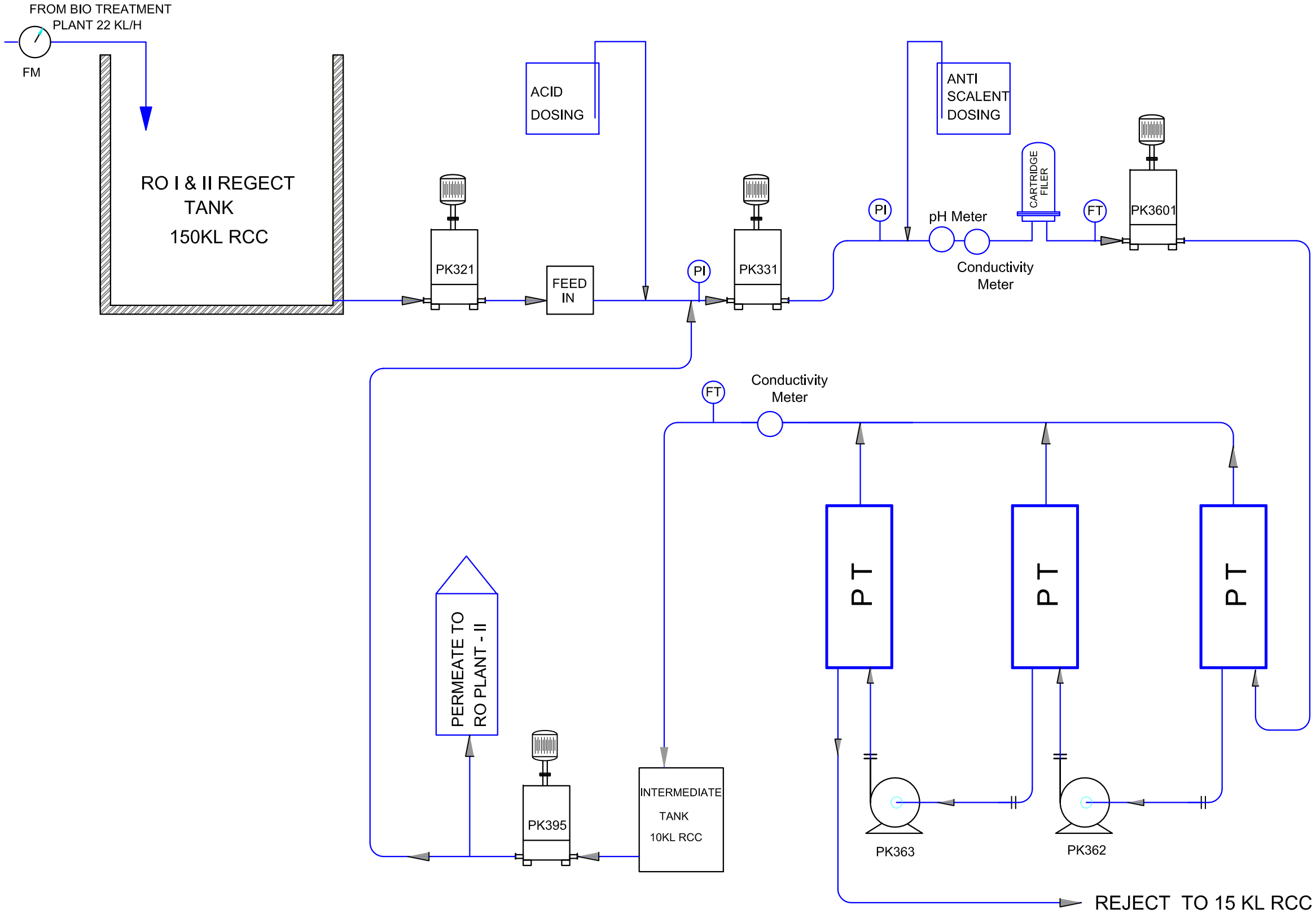
Rev.No	REASON	DATE

DEPARTMENT	SIGN.	DATE
DRAWN BY		
CHECKED BY		
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF RO PLANT - I I
(1105 KLD)

FILE NAME	D: \ ZLD FLOW	REV.NO
DRAWING.NO.	SSL/P/LO-9769/ZD/00/16	00



Tag.No.	Eq.Name	MOC	KL	HP
x	RO Feed Tank	RCC	150	
PK321	Pre Filter Pump	SS	11.3 KL/H	
PK331	Pre Filter Pump	SS	-	
PK3601	High Pressure Pump	SS	-	
PK362	Booster Pump	SS	10.4 KL/H	
PK363	Booster Pump	SS	10.4 KL/H	
x	Permeate Tank	RCC	10 KL	
PK395	Intermediate Pump	SS	7.5 KL/H	
x	P T - 3 Nos		151 KLD	

DESIGN PARAMETERS (INLET)

FEED RATE (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
151	6 - 6.5	26750	—	1940

DESIGN PARAMETERS (OUTLET)

Treated (KLD)	pH	TDS (PPM)	TSS (PPM)	COD (PPM)
105	—	1875	—	195

Rev.No	REASON	DATE

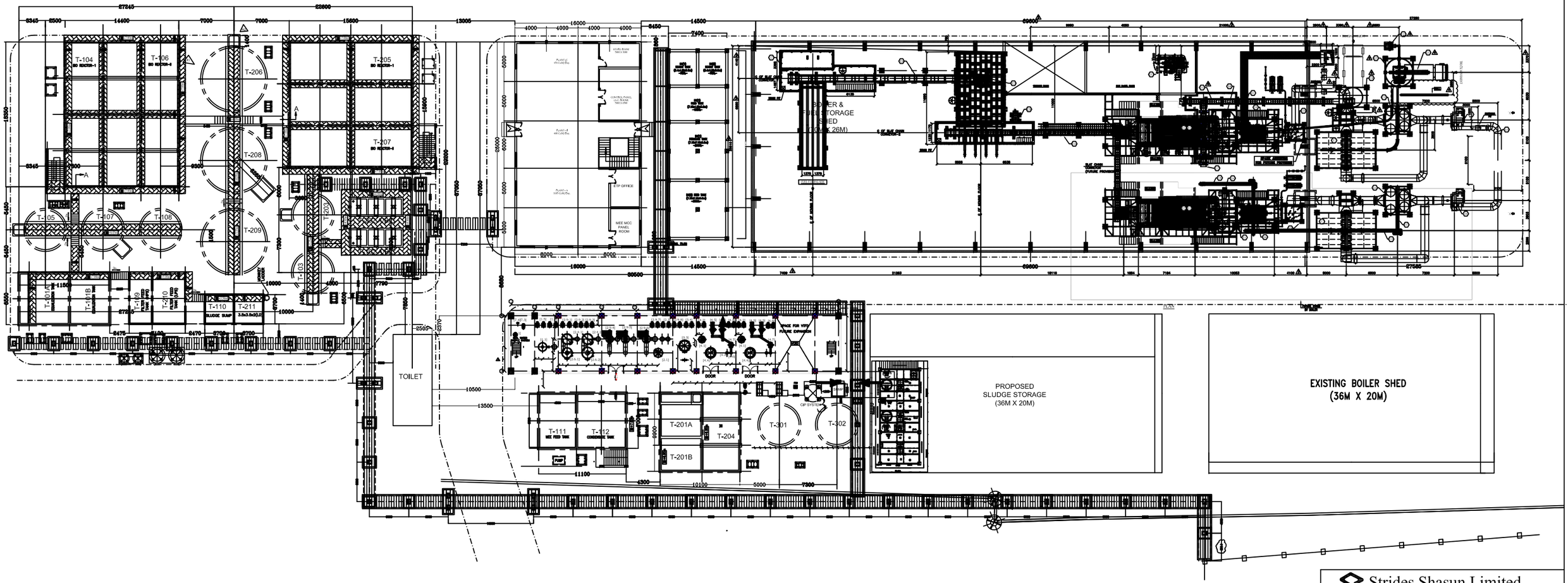
DEPARTMENT	SIGN.	DATE
DRAWN BY		
CHECKED BY		
REVIEWED BY		
APPROVED BY		

Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

FLOW DIAGRAM OF RO PLANT - III
(151 KLD)

FILE NAME	D: \ ZLD FLOW	REV.NO
DRAWING.NO.	SSL/P/LO-9770/ZD/00/16	00

LAYOUT FOR ZLD AREA



Strides Shasun Limited
SHASUN ROAD, PERIAKALAPET, PUDUCHERRY-14.

GA DRAWING FOR ZLD

No.4/ PPCC / HWM / JSA / 2017/ 602

PUDUCHERRY POLLUTION CONTROL COMMITTEE
III, FLOOR, HOUSING BOARD BUILDING, ANNA NAGAR, PUDHUCHERRY
* * *

Phone: (0413) 2201256
Fax : (0413) 2203494
Puducherry , the 10 AUG 2017.

To
M/s Strides Shasun Limited.,
R.S. No. 33 & 34, Mathur Road,
Periakalapet,
Puducherry .

Sub: PPCC - Amendment of authorization under Hazardous and Other waste (Management and Transboundary Movement) Rules, 2016 - Reg.
Ref: (i) Authoristion No.4/PPCC/HWM/JSA/31, dated 30.06.2016.
* * *

In the authorization renewed by this office on 30th June 2016, the column No. 2 of the authorization of the unit shall be read as given below:

Schedule No.	Name of the HW	Quantity in KLA/TPA	Method of Storage / Disposal
35.3 of Schedule I	Chemical Sludge from waste water	4800	Shall be stored in barrels and kept on the concrete floor and disposed through the authorized person.

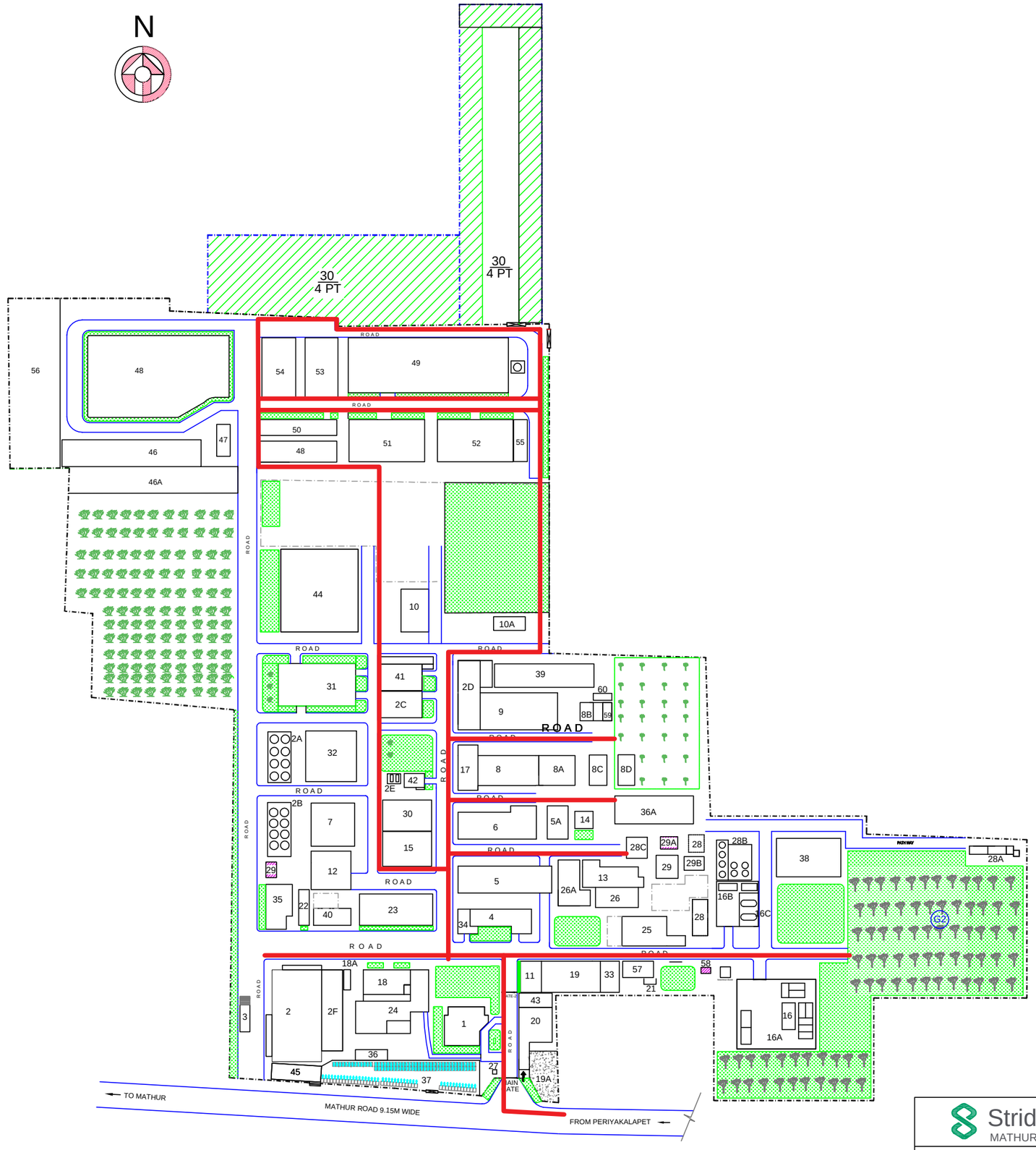
All other conditions remain unchanged.

For and on behalf of PPCC,

(M.DWARAKANATH)
Member Secretary
Puducherry Pollution Control Committee

Copy to: Guard file.

Annexure 13 Stormwater Drain layout



NO.	BLOCK NAME
1	ADMINISTRATION BLOCK
2	R.M STORES-1
2A	R.M STORAGE TANKS - 1
2B	R.M STORAGE TANKS - 2
2C	DRUM STORAGE SHED
2D	IBU DERIVATIVE CLEAN ROOM - I
2E	RM STORAGE TANKS - 3
2F	IBUPROFEN FINISHED PRODUCT STORAGE - 2
3	WEIGHING BRIDGE
4	Q C LAB
5	IBUPROFEN SECTION
5A	IBUPROFEN SOLVENT STORAGE AREA
6	PILOT PLANT
8	ALDEHYDE SECTION
8A	ALDEHYDE SECTION (ATFE)
8B	REBOILER SECTION
8C	ALDEHYDE TANKS YARD
8D	IBAP TANKS YARD
9	IBU DERIVATIVE SECTION
10	IBU DERIVATIVE F.P STORAGE - 2 / SAFETY DEP
10A	ETP HAZORDOUS SECURED LAND FILL AREA
11	IBUPROFEN FINISHED PRODUCT STORAGE - 3
12	IBUPROFEN PACKING SECTION - II
13	CHILLING PLANT - OLD
14	PURIFIED WATER GENERATION PLANT
15	IBUPROFEN PACKING SECTION - I
16	HOSE STORAGE SHED (CLASS - A)
16A	CLASS 'A' PETROLEUM STORAGE
16B	CLASS 'B' PETROLEUM STORAGE
16C	CLASS 'C' PETROLEUM STORAGE
17	IBU DERIVATIVE CLEAN ROOM - II
18	GENERAL STORES
18A	CYLINDER STORAGE SHED
19	POWER HOUSE
19A	H.T YARD
20	SECURITY OFFICE - 1
21	GARDEN IN-CHARGE ROOM
22	ACTIVATED CARBON & REJECTED ROOM
23	IBUPROFEN PHARMA SECTION
24	CANTEEN,REST ROOM,RFT,QA, IT DEPT. AND Q.C RESERVE SAMPLE ROOM
25	BOILER HOUSE,AIR COMPRESSOR & NITROGEN PLANT
26	CHILLING PLANT (NEW)
26A	CHILLING PLANT TANKS YARD
27	VINAYAGAR TEMPLE
28	LAYER COLLECTION TANKS
28A	EFFLUENT PUMP HOUSE
28B	WASTE DICHROMATE STORAGE TANKS
28C	SOURCE WATER STORAGE TANK
29	1500 TR - COOLING TOWER
29A	500 TR - COOLING TOWER
29B	500 TR - COOLING TOWER
30	IBUPROFEN FINISHED PRODUCT STORAGE - 1
31	ENGNEERING SECTION
32	NEW IPCA SECTION
33	ELECTRICAL WORK SHOP
34	PANEL ROOM
35	FIRE HYDRANT SYSTEM
36	TOILET
36A	R.O PLANT (BOILER FEED)
37	TWO WHEELER SHED
38	EFFLUENT TREATMENT PLANT (OLD)
39	IBU DERIVATIVE TANK YARD
40	RECOVERY PLANT
41	SODIUM SECTION
42	IBU DERIVATIVE FINISHED PRODUCT STORAGE
43	CAR SHED
45	SECURITY OFFICE - 2
46	CONTRACTORS WELDING SHED
46A	CONTRACTORS SHED
47	TOILET
48	BIOLOGICAL TREATMENT PLANT
49	NEW BOILER SHED & TURBINE
50	MULTIPLE EFFECT EVAPORATOR
51	FUEL STORAGE SHED
52	OLD BOILER SHED
53	TREATED WATER STORAGE
54	RO PLANT,COOLING TOWER & MCC PANEL ROO
55	WATER PRE - TREATMENT PLANT
56	SCRAP YARD
57	DIESEL GENERATOR
58	BREATHING AIR COMPRESSOR
	PROPOSED NEW BLOCKS
7	NEW PRODUCTION BLOCK -2
44	NEW PRODUCTION BLOCK-1
59	HYDROGENATION SHED
60	HYDROGEN CYLINDER SHED

Strides Shasun Limited
MATHUR ROAD, PERIYAKALAPET, PUDUCHERRY-14

Title

Strom Water Drain Layout

FILE NAME	D:\SITE PLAN	REV.
DRG.NO.	PYA / SP - 01	R(

STRIDES SHASUN LIMITED,

PUDUCHERRY

ONSITE EMERGENCY PLAN

FEB - 2017

CONTENTS

ANNEXURES

Annexure 1 - General Plant Layout

Annexure 2 - Process Flow Chart

Annexure 3 - List of MSDS for all chemicals

Annexure 4 - List of Hazardous Chemicals enclosed

Annexure 5 - Emergency Escape route layout enclosed

Annexure 6 - Fire Extinguishers Layout

Annexure 7 - Breathing Air Mask Layout

Annexure 8 - Emergency Safety Shower Layout

Annexure 9 - List of Important Telephone Numbers

Annexure 10- Wind socks layout

Annexure 11- A list of first aid material and medicines

Annexure 12- Fire Hydrant system layout

Annexure 13- Fire alarm system layout

INTRODUCTION

1.1 PREAMBLE

Chemical/Petrochemical Industries, Refineries etc., handles, manufacture and store various chemicals, which possess hazardous properties and also hold potential to cause accidents to personnel and property, the effect of which at times may exceed the plant boundaries.

1.2 NEED

Sections 41B (4) of Factories Act, 1948 and Rule-65U, Rule 13 of Manufacture, Storage, Handling and Import of Hazardous Chemicals Rule 1989 Promulgated under Environment Protection Act 1986 have stipulated that factories handling Hazardous Chemicals in excess of prescribed threshold quantities have to prepare an On-site Emergency Plan and submit it to the statutory authorities. In order to fulfill this statutory obligation this plan has been prepared.

PLANT INTRODUCTION

2.1 Location

M/s. Strides Shasun Limited is having their unit at Mathur Road, Periya Kalapet, Puducherry and is situated at 17 kms from Puducherry. On the East side the Puducherry – Chennai East Coast Road. Puducherry, which is a Union Territory and U.T Capital, is well connected by Rail and Busses. The National Highway is situated at about 25 kms away. The Fire Service department is situated at Periya Kalapet, Puducherry-14.

2.2 Approach

Periakalapet Village with a population of about 5000 people is situated in the East at a distance of about 1½ kms. Mathur Village with a population of about 1500 people is situated on the West at a distance of 2½ kms. On the Northern direction dry lands are present and on the South side a school is situated within about 100 – 150 mts where there are about 800 students are studying. Few hutments' inhabiting less than 50 people is in the east-south east direction within about ½ km.

M/s. Chemfab Alkalis is the only nearest factory situated in the southeast direction at a radial distance of about 1½ kms.

The road linking Mathur Village with Periakalapet is the only approach road to the factory.

The general layout of the plant is shown in **Annexure- 1**

2.3 - Management Philosophy:

The Management is highly conscious of their responsibilities towards their employees and society. The management is consciously undertaking steps to improve Process Operations, safety and health of the employees. They are adopting various steps for Recycling, Reducing and Recovering, so that effluent generation is minimum and quality of environment is not affected.

2.4 - Man Power:

The plant employees around 593 people, which includes operation and maintenance personnel who are well qualified and experienced in the process.

2.5- Shift Timings:

The plant is operating round the clock in 3 shifts besides one general shift.

1st shift	-	6.30 a.m. - 2.00 p.m.
2nd shift	-	2.00 p.m. - 9.30 p.m.
3rd shift	-	9.30 p.m. - 6.30 a.m.
General shift	-	9.00 a.m. - 5.30 p.m.

2.6. Weather Conditions and Regional Meteorology:

The thirty-year average data collected from the India Meteorological Department are summarised below:

2.6.1. Temperature and Humidity:

The area experiences extremes of heat and cold and the data is as follows:

- The months January, February, March, November and December have nice weather with a good average temperature.
- On average, the temperatures are always high.
- A lot of rain (rainy season) falls in the months: January, February, September, October, November and December.
- On average, the warmest month is July.
- On average, the coolest month is January.
- December is the wettest month. This month should be avoided if you don't like too much rain.
- Driest month is February, with 9 mm of rainfall. Most precipitation falls in November, with an average of 285 mm.
- The warmest month of the year is June, with an average temperature of 32.1 °C. In January, the average temperature is 24.5 °C. It is the lowest average temperature of the whole year.

Mean daily Maximum Temperature 35^{o}C, Mean daily Minimum Temperature 24^{o}C.

Humidity – Mean daily (Max) – 90% (Monsoon)

Mean daily (Min) - 55%

Mean daily relative – 70% @ 40^{o}C

2.6.2. Rainfall:

Maximum Rainfall is 1171 mm per annum. Normal Rainfall is 110 mm per month.

2.6.3 Wind Pattern

The wind speed is mostly in the range of 2 - 15 km/hr. The predominant wind directions are South to North.

ON-SITE EMERGENCY PLAN

3. ON-SITE EMERGENCY PLAN (O.S.E.P)

What is Emergency?

A major emergency can be defined as an accident/ incident that has potential to cause serious injuries or loss of life. It may cause extensive damage of property, serious disruption both in production and working of factory and may adversely affect the environment. The following factors may cause major emergency.

(i) Plant failure.
(ii) Human error.
(iii) Vehicle crash.
(iv) Sabotage.
(v) Earthquake.
(vi) Natural Calamities.

On-site Emergency:-

If the consequences of an industrial accident will be limited within the factory premises then that can be termed as on site Emergency and a plan developed to tackle such an emergency is called on-site emergency plan.

The purpose of the OSEP is aimed at providing basic guidelines to the concerned for effectively managing the resources at their command.

Statutory Provision:-

After the Bhopal gas tragedy (1984) and Supreme Court direction in case of M/S. Sriram Foods and Fertilizers, the Govt. of India has made some important amendments to the Factories Act 1948 in the year 1987 with incorporation of special provisions relating to hazardous process. Under Section 41(B) (4) every occupier is to prepare On-site Emergency Plan and detailed disaster control measures for his factory. Again under provision of Rule 13 of the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989, the occupier shall prepare and keep up to date On-site Emergency plan containing details how major accidents will be dealt with on the site on which the industrial activity is carried on and that plan shall include the name of the person who is responsible for safety on the site and names of those who are authorized to take action in accordance with the plan in case of emergency.

In Assam Major Accident Hazard Control Rules 1992 under Rule 13 provision for preparation of On-site Emergency Plan by the occupier has been laid down in the same line stated above. The

occupier shall ensure a mock drill of the on-site emergency plan is conducted at least once in every six months. A detailed report of the mock drill conducted under rule shall be made immediately available to the Inspector and Chief Inspector

3.1 Scope of the OSEP:

The OSEP will be identifying emergency situations, areas that are likely to be affected, the emergency action to be taken, and the key personnel with their responsibilities, along with other general detail like plant layout, infrastructural facilities, neighboring industries, and possible mutual aid facilities. This plan will not cover the emergencies leading to off site consequences.

3.2 General Considerations of Emergency Management:

An emergency situation arises out of an accident and it can lead to loss of production, damage to property, human suffering etc. A major emergency occurs suddenly with a potential to cause loss of life and serious impairment to property and environment. The OSEP is limited to operations and facilities within the plant.

3.3 Main Objectives of On-Site Emergency Plan:

1. To avoid panic and fixing responsibilities.
2. To save the lives of the plant, personnel and Environment.
3. To minimize the effects of the accident on people and property, Environment and Natural resources.
4. To take steps to fight fire or to contain leak or spill in the early stages so that it doesn't escalate into off site emergencies.
5. To control and localise the emergency.

Steps to minimize the effects will include First aid, Rescue, Evacuation, rehabilitation and mitigation.

ELEMENTS OF ON-SITE EMERGENCY PLAN

3.4 Elements of on-site emergency plan:

Detailed objectives will be as follows:

1. Control of the occurrence, limiting & localising the emergency and eliminating the hazard.
2. Arrange for safe shut down of the plant.
3. Ensuring the safety of the people.
4. Rescue and rehabilitation of people as required.
5. Rendering first aid and medical attention.
6. Providing information to the relatives of the injured and statutory authorities.
7. Making sure about the safety of the place before reentry.
8. Preservation of records and evidence for investigation purpose.

3.5 Elements of a good emergency plan:

To achieve the above stated objective the following elements will be addressed.

1. Management's Commitment.
2. Identification and estimation of possible hazardous events.
3. Good communication systems with necessary back up.
4. Identification of Key personnel and defining their responsibilities.
5. Fixing up the Emergency Control Centre, Assembly Points, etc..
6. Guidelines about emergency action to be taken.
7. Making available various information like, Operation manuals, Location and Quantity of Hazardous materials, List of experts/organization for help, District and Statutory Authorities, M.S.D. Sheets, Antidotes, First aid, etc.
8. Familiarizing all concerned by Training, conduct of mock drills, periodical review and updating.

3.6 Name and Address of person giving information:

Mr.E.KANNAPIRAN (Vice President).

Strides Shasun Limited.

Mathur Road, Periyakalapet,

Puducherry – 605 014.

Ph.No: (0413) 2654104

Mobile - 7373734891

3.7. Location of different hazardous materials storage and hazardous operations are marked in Plot Plan enclosed in drawing.

ANTICIPATED EMERGENCY

4. DETAIL OF POSSIBLE EMERGENCIES

4.1 Brief Process Description:

4.1.1 General:

M/s. Strides Shasun Limited has been licensed to manufacture a number of basic drugs and intermediates. Presently only one basic drug (i.e.) Ibuprofen. This plan covers only the hazards involved in this operation. The plan will be reviewed and updated periodically.

4.1.2 Ibuprofen Process:

Stage-1: 1st Intermediate:

This stage is being procured from outside source.

Stage - II: 2nd Intermediate:

Iso propanol and monochloro acetic acid is reacted with sulphuric acid at a temperature of about 40 – 50 ^{o}C maintained by the exothermic nature of the reaction itself. The Iso propylchloro acetate (IPCA) formed is neutralized with sodium bi-carbonate and distilled to get IPCA. The diluted acid layer and the aqueous bi-carbonate fraction are sent for treatment plant. The second stage intermediate IPCA is stored.

Stage- III: Sodium Reaction and Esterification

The sodium metal is received as cut pieces. It is charged to isopropanol in presence of ferric chloride catalyst and the reaction proceeds at not more than 95^{o}C to form sodium iso propoxide and hydrogen

in an inert atmosphere. The sodium iso propoxide is reacted with IBAP and IPCA at not more than 40^{o}C to form epoxy ester. The iso propyl alcohol is recovered by distillation and the epoxy ester is separated.

The ester is hydrolysed with water and caustic lye to form an aldehyde at a temperature of 60 – 65 ^{o}C. Hydrochloric acid is used for neutralisation and the crude aldehyde and aqueous layer is separated. The crude aldehyde is degassed under low vacuum condition of about 300 – 500 mm Hg and then subjected to high vacuum distillation of 730 – 760 mm Hg to obtain pure aldehyde. Hi-therm oil circulation is used for high vacuum distillation. The aqueous layer is distilled to recover IPA.

Stage-IV: Oxidation:

Sodium di-chromate is reacted with sulphuric acid in an aqueous medium at 40 ^{o}C to form Jone's Reagent and cooled to less than 30^{o}C.Acetone is taken in to an oxidation reactor and Jones reagent and aldehyde are added simultaneously maintaining the temperature not more than 30^{o}C. The mixture is distilled to recover acetone. Hexane solvent is added for extraction and the waste dichromate layer and organic layer is separated. The organic layer is water washed and activated carbon is added for filtration and the mass is sent to crystalisers. The carbon waste gets separated in filters. From the crystalisers it is sent to centrifugation where the mother liquor gets separated. The centrifuged mass is washed with chilled hexane. The product Ibuprofen is dried, milled, sieved, blended and packed.

Stage-V: Mother Liquor Treatment:

The mother liquor is treated with caustic lye and the hexane layer and alkaline layer is separated. The hexane layer is distilled and recovered. The residue is sent for disposal. The alkaline is neutralised with Hydrochloric acid. The aqueous layer is separated and sent for effluent treatment. The remaining Ibu profen precipitated mass is mixed with hexane and washed with process water and is filtered after adding activated carbon. It is sent to crystaliser and then centrifuged and Ibu is separated.

Attached the Process Flow Chart – **Annexure 2**

4.2. Description of Different Manufacturing Activities:

The plant consists of the following distinct activities:

a) Ibuprofen Production Section.

b) Aldehyde Production Section.

c) Ibu Derivatives Production Section.

d) Utilities.

4.3. Detail of Safety Management System:

Safety Management Systems Existing to Avoid/Tackle Emergencies. The following measures has been taken.

1. All the Class 'A' flammable solvent storages are designed as underground storages.
2. The Electrical motors and fittings in the hazardous areas are of flameproof type.
3. The pipelines carrying highly flammable solvents are provided with bonding arrangement.
4. The motor and the equipments in hazardous areas are provided with earthing connections.
5. The vessels operating above atmospheric pressure are provided with safety relief valves.
6. The vessels are tested as per statutory norms.
7. All the areas in the plant are provided with fire extinguishers. Fire hydrant system with ring mains is available to meet the fire emergency.
8. Windsock is provided to indicate wind direction in six locations in the plant.
9. On-Site Emergency Plan has been prepared and key personnel identified.
10. Training is carried out regularly on various aspects of safety, fire fighting, first aid, etc.
11. Inert gas provision (N_2 purging) is given for the reactors, centrifuges, etc.
12. Preventive maintenance schedule is drawn and being followed.
13. Diesel generator is available and can take care the power requirements during emergency.
14. Adequate numbers of persons are trained in first aid and are available in shifts.
15. Vehicles entering the plant are provided with exhaust spark arrestors.
16. An ambulance is available in all the three shifts.
17. Self-contained breathing sets are available and people are trained in the use of these equipments.
18. Personnel working in sodium charging are using Aluminised hood and fire resistant suit.
19. Persons working in centrifuge operations are provided with uniforms made of fire retardant fabric.
20. All statutory compliances like testing of earth pit, transformer oil, lifting tackles are followed.

21. The properties of hazardous chemicals are made available in the departments.

22. In critical operation like sodium cutting, temperature and humidity are controlled.

23. The plant personnel and security guards are trained in the use of fire extinguishers.

4.4 IDENTIFIED EMERGENCIES HAVING ON SITE POTENTIAL:

Preliminary analysis has identified the following possible scenarios capable of having potential for causing On-Site Emergency.

4.5. Preliminary analysis is carried out based on the inventories of raw materials, type of storages, their physical, chemical and other characteristics.

The following table gives the salient detail of the hazardous chemicals used in the process.

Based on the Schedule I – the Indicative Criteria and list of Chemicals – Part I & II and also based upon the Schedule II and Part II of Schedule III, the list of chemicals & Inventory were verified.

a) The following chemicals have been listed in Part II of Schedule I as hazardous chemicals.

   Acetone
   N-Hexane
   Methanol
   MCA
   Hydrogen Chloride
   Sulphuric acid

b) Based on the indicative criteria the following are classified as highly flammable liquid i.e., having a flash point less than 23 ^{o}C & Boiling Point above 20 ^{o}C at normal pressure.

   Acetone
   N-Hexane
   Methanol
   Iso Propyl Alcohol

c) The following chemicals are classified as flammable liquids

   Diesel
   Iso Propyl chloro acetate
   Furnace Oil

d) Based on the DOT classification and labelling none of the chemicals fall under the category of poison.

   Nil

e) Similarly according to DOT classification the following are classified as 'Dangerous when wet'.

Sodium

f) The following are classified as Corrosive

Sodium Hydroxide lye

Sodium Hydroxide flake

Hydrochloric Acid

Sulphuric acid

Sodium Dichromate

Mono chloro acetic acid

g) As per the criteria for toxic chemicals the following chemical can be also classified as highly toxic

Caustic soda flakes

Sodium di-chromate

h) The quantities held in inventory is less than the quantities presented in Schedule 3 and Group 5 excepting Iso Butyl Benzene and Iso Propyl chloro acetate.

List of MSDS for all chemicals attached – **Annexure 3**

4.5.1 Identification of hazards chemicals:

I. Flammable

Acetone

N-Hexane

Iso Propyl Alcohol

Methanol

Toluene

Furnace Oil

Diesel

II. Flammable & Toxic

Nil

III. Flammable & Reactive

Nil

IV. Poisons & Flammable

Nil

V. Dangerous when wet

Sodium

VI. Corrosive

Mono chloro acetic acid

Sodium Hydroxide lye

Sodium Hydroxide flake

Hydrochloric Acid

Sulphuric acid

Sodium Dichromate

List of Hazardous Chemicals enclosed – **Annexure 4**

4.5.3. Identification of Hazardous Locations:

I. Process Plants

a) Ibuprofen Process Plant
b) Mother Liquor Treatment Plant
c) Ibu derivative Plant

II. Storages

a) Sodium metal storage
b) Solvent bulk storage
c) Solvent storage day tanks
d) Raw material stores

III. Utilities and Auxiliaries

a) Chilling plant
b) Boiler
c) Diesel generating set area

4.6. ANTICIPATED EMERGENCY SITUATIONS:

4.6.1. Anticipated Emergencies in Storages:

a) Fire in solvent storage

b) Fire in Sodium Metal storage

c) Fire in diesel oil storage

4.6.2. Spillage of Acid, Alkalis due to failure of storage and pipe line:

a) Spillage of corrosive materials.

4.6.3. Anticipated emergencies in process plants/operations:

a) Fire in solvent distillation/recovery operation

b) Fire in solvent handling /addition in process reaction

c) Fire in centrifuge operation

d) Fire & Explosion in Sodium handling/addition

4.6.4 Anticipated emergencies in product and storage:

a) Decomposition, Fire and Toxic gas release in product storage.

4.6.5. Other Reasons:

a) Natural calamities like Tsunami, Cyclone, Earthquake, Floods, etc., and other external threats can trigger any of the above emergencies.

EMERGENCY ORGANISATION

5.0 List of Key Personnel:

a) Head (Operations) is nominated as the Work Main Controller (WMC), Dy.Head (Production) will officiate as Work Main Controller in the absence of Head (Operations); W.M.C will be the overall command of emergency organisation.

b) Dy.Head (Production) is designated as the Works Incident Controller (W.I.C) and in his absence the D.G.M. (Production) will function as W.I.C. He will be in charge of directing the efforts at the scene of emergency.

c) Shift-in-charge of all plants.

d) Dy. Head (Services).

e) Dy. Head (Safety)

f) Dy. Head (Personnel & Administration)

g) E.T.P. in-charge

h) Executives of all departments.

Apart from the key personnel, certain employees in shifts are identified as essential employees to combat emergencies.

5.1 Essential Employees:

a) Shift operators of the process plants, Electrician and Mechanic in shift.

b) Electrical supervisor, fire guards, security guards, ETP operator, shift chemist in Q.C. lab, operators in R.M stores and General stores, chemists in process control lab and PID lab and drivers have been designated as essential employees during shift timings.

c) These people will report at the site of emergency to the Works Incident Controller and carry out his instructions.

Any other Person(s) requisitioned by W.M.C / W.I.C from time to time will also be treated as essential employees.

Since the Shift-in-charge is expected to receive the first message about any emergency, he is considered to hold greater responsibility in controlling the emergency situation till the arrival of W.I.C/ W.M.C and other key personnel at the scene of emergency.

EMERGENCY PROCEDURES

6. EMERGENCY PROCEDURES

6.1 Declaration of Emergency:

6.1.1 Informer of an Emergency

The person who notices first an emergency situation (only in case of fire) in the factory will activate the fire alarm and convey the message to fire guard on duty. He will contact the Shift-in-charge and intimate about the emergency either over intercom or other means.

6.1.2 Particulars to be furnished:

The informer and receiver must identify each other first. The informer then gives the detail about the exact nature of the incident and location and also any other relevant information. The communication must be brief and precise.

E.g.: There is a fire of Material thro' a leak from pump in IPCA Plant (source ea).

6.1.3 Declaration of Emergency:

The Shift-in-charge on receipt of the information will initiate the following action.

a) Take steps to contain the control the emergency situation.
b) Arrange to inform the key personnel about the incident.
c) He will perform the duties of W.M.C/W.I.C till their arrival at the scene and decides about declaration of emergency based on the severity of the incident.

6.1.4 Assembly Points:

Assembly Point is designated in front of administrative building based on the predominant wind direction.

Emergency Escape route layout enclosed **– Annexure 5**

6.1.5 Emergency Control Centre:

The room adjacent to Security office near the Main gate is designated as Emergency Control Centre.

6.2 Emergency Actions:

The following actions are to be taken during emergency.

1. To initiate Safe shut down of the plant.
2. To ensure Safety of persons and property.
3. To take action for controlling the emergency.
4. To take suitable measures to avoid spreading of emergency.

6.2.1 Different Types of actions that are to be initiated by the emergency team is broadly outlined below:

In case of fire:

1. If it is possible try to approach and stop the leak of material or close the main valve.
2. Transfer of material to be done depending upon the circumstances.
3. Try to approach with caution and use fire extinguisher or water or foam arrangements based on the nature of fire.
4. If the chances of escalation exist and to save the surroundings steps have to be taken to cool the surroundings and storages.
5. If it is possible the source of ignition can be removed.
6. Isolate any power sources nearby.
7. Try to contain the leak and avoid spreading.
8. Always use the appropriate personal protective equipments.

Fire Extinguishers Layout attached **– Annexure 6**

In case of toxic release:

1. Approach from upwind direction continuously.
2. Wear all PPE'S including Respiratory Protection.
3. If possible try to arrest the leak using proper gadgets.
4. Take steps to transfer the contents to another storage tank.
5. If the spill is small use absorbing materials to absorb the spill.

Breathing Air Mask Layout enclosed **– Annexure 7**

In case of Spurting:

1. Cut off stream.
2. Spray cold water on the mass.
3. Evacuate the people nearby.

6.2.2 Management of spills and leaks – Mopping up / Decontamination Procedures:

While storing and handling various chemicals having toxic, flammable & corrosive properties, various safe guards are introduced in the engineering stage itself like dyke walls, etc., still the chances for leaks and spills do.

Exist. Such leaks pose risk if left unattended. Chemicals depending upon the nature of hazard require different procedures to control the emergency. The specific procedures for containing the leaks and spills, mopping up operations of specific hazardous chemicals are well trained to our employees**.**

Emergency Safety Shower Layout enclosed – **Annexure 8**

6.2.3 Key Personnel and Essential Employees:

All the designated people will report to the place and take instructions from W.M.C/W.I.C.

6.2.4 Shut Down of the Plant:

If the emergency warrants shut down of the plant, it must be done according to the procedures laid down in the operating manuals of that section. The procedures are available in all the units and all the operating personnel are familiar about the procedures.

6.2.5 Auxiliary Requirements:

In case of fire the main power to that section must be switched off on consultation with respective shift in charge. Diesel Generator must be started to cater to the emergency equipments. Firewater tank level must be maintained so as to ensure adequate water supply for the fire fighting operations.

6.3 Procedures to be followed by the Essential Employees:

In order to effectively tackle by the emergency the teams have been formed as given in emergency task team.

EMERGENCY SERVICES

6.3.1 Emergency Task Team (ETT):

This team comprises of the following

Leader - Shift-in-charge (Production)

Assistants –	Shift Electricians	- 2 Nos.
	Shift Operators	- 3 Nos.
	Shift Mechanic	- 2 Nos.
	Mechanical Supervisor	- 1 No.

On hearing the siren and announcement of emergency the leader will reach the scene of emergency with his team and with necessary personnel protective equipments like SCBA, Goggles, Gloves, PVC Suits, etc., and report to the Works Incident Controller.

As per the instructions of W.I.C the team will initiate steps to control the emergency to safely shut down the operations and to minimise the damage effects.

They will do the following:

a. To safely shut down the plant.
b. To stop the leak, spillage and control the emergency
c. To carry out necessary maintenance needed
d. To take steps to restart the plant after the conclusion of emergencies.

6.3.2 Loss Control Team:

This team comprises of the following

Leader – Shift Supervisor

Assistants - Shift Operators – 4 Nos

The team reports to W.I.C at the scene of emergency and based on the instructions of W.I.C carry out suitable actions like fire fighting with appropriate equipments, cooling of adjacent equipments and structures containing the spread and fire fighting.

This team will cordon off the area, search for trapped persons & rescue, fight fire, contain the spreading, clear the area free of debris and prevent escalation of the emergency to other area.

6.3.3 First Aid Team

Leader – Shift Supervisor (R.M.S)

Assistants - Shift Assistants - 2Nos.

Shift Male Nurse - 1 No.

This team reports to the W.I.C with necessary things like stretcher and as per the instructions carry out the first aid and rescue requirements for the injured.

This team will render first aid and bring the affected in stretcher, etc., to First Aid dispensary. Assess the need for outside treatment and inform WMC.

Make sure adequate stock of first aid materials. To ensure additional supplies if needed.

6.3.4 Communication Team:

Leader - Shift Chemist

Assistants - Shift Chemist - 2 Nos.

This team will communicate with other depots as directed W.I.C/W.M.C. Intimate W.M.C about the need of mutual aid/Fire station assistance. Contact all the key personnel and intimate.

6.3.5 Security Personnel:

The security guards on duty and the driver on duty will respond to the emergency call.

The security persons on hearing the emergency siren will ensure the following:

a) Exercise control on entry of persons and vehicles into the plant.
b) To ensure evacuation of all trucks to the outside parking area.
c) To arrange for head count of people at the Assembly Point.
d) Direct all calls and enquires to the W.M.C.

The driver will take the ambulance and report to the scene of emergency and bring the injured to the OHC and then transport the injured to hospital based on the need.

6.4 PROCEDURES FOR EVACUATION:

6.4 Procedures for Evacuation:

On declaration of emergency through siren / announcement all persons who have not been designated as essential persons will have to leave their respective places of work and reach the Assembly Point thro' a designated escape route. Arrow markings in fluorescent paint/ indication boards have been made indicating the route to be taken to reach Assembly Point. All employees are made familiar with the routes so they can reach the Assembly Point without panic.

6.4.1 Evacuation:

If any evacuation becomes necessary persons gathered at the assembly points will be transported to the predetermined shelters by available transports.

6.4.2 Head Count:

At the Assembly Point, the head count will be taken by the personnel department with help of security and will be communicated to the Site Controller. Verification will be made with the persons present inside the plant and suitable action for search/rescue will be initiated for the missing persons.

6.5 First Aid:

All the injured will be brought to the first aid centre where the Doctor/Para medical staff will render necessary first aid and refer the cases to hospital for further medical attention depending upon the severity. Necessary transport will be made available for transporting the patients to Hospitals.

6.6 Emergencies during Holidays:

Being a continuous process industry the shift in incharge (IBU) will assume overall charge of any emergency and initiate suitable action to control the emergency till the incident controller/site controller takes charge of the situation.

COMMUNICATIONS

7. EMERGENCY COMMUNICATION:

7.0 Communication of Emergency:

The siren (Fire Alarm Wailing Sound 90 Seconds) / public announcement is used to intimate everyone about the existence of an emergency in the plant.

The siren can be activated from the Fire Alarm Control Panel through all call point selection in the amplifier, on instruction from W.M.C.

There are 40 Horn Speakers are installed at various locations of the factory area. It shall be activated by W.I.C or shift-in-charge or the fire guards on instructions. The sound will be of high-pitched intermittent wailing sound there by differentiating from the normal tone. The siren can be operated with Battery power in case of failure of E.B. Power.

Intercom is available for internal communications. If power has failed and telephones become in operative Walkie-Talkie and megaphone which is available will be used.

List of Important Telephone Numbers enclosed – **Annexure 9**

7.1 Emergency Control Centre:

Emergency Control Centre has been designated and site controller will receive and give all communications from this centre. Till the arrival of site controller the shift in charge will discharge these duties from his post/scene of emergency.

7.2 All Clear:

The all-clear signal would be sounded as per the instruction of the site controller. It will be one long whistle for one-minute (60 Seconds) duration indicating the conclusion of emergency.

EMERGENCY RESPONSIBILITIES

8.0 Emergency Responsibilities

8.1 Role of Shift-in-charge:

On receipt of information about emergency in the plant initiates the following actions.

a) Arrange to inform the key personnel about the emergency.

b) Reach the scene of emergency; assess the situation and initiate necessary action to contain the emergency.

c) If the conditions warrant take steps to shut down the plant.

d) If it is felt that the situation is serious declare emergency, arrange for sounding of siren to alert people and arrange for evacuation of persons.

e) Hold charge till the incident controller arrives at the site.

8.2 Role of Works Main Controller – Head (Operations):

a) On receipt of the information he will reach the emergency control centre assumes charge of the entire emergency operation. In the absence of Head Operation, GM-Production will act as Works Main controller.

b) Assess the situation in consultation with Incident Controller/Shift Engineer and Declares emergency if the situation warrants.

c) Be in close touch with the Incident Controller and co-ordinates all action concerning safe shut down, control of emergency, decontamination, etc.

d) Co-ordinates all actions regarding rescue, head count at assembly point, first aid, admission to hospitals, evacuation if required.

e) Directs all operation for fire fighting.

f) Arranges for dissemination of proper information to the relatives of employees, public, media, etc.

g) Inform all statutory authorities like Factory Inspectorate, Pollution control board Controller of explosives, etc.

h) Inform all neighboring industries about the emergencies.

i) Get in touch with the industries that have agreed upon mutual aid scheme and seek assistance if required.

j) If the situation is likely to get escalated and lead to off-site implications he will inform about the incident to Dist. Collector, Superintendent of Police, nearest Police Station, Dist. Fire Officer,

Dist. Medical Officer, Primary Health Centre, Regional Transport Officer, Factories Dept., Government and Private Hospitals, Voluntary Organisations, etc., and proceed with off-site emergency plan.

k) Seek the help of outside experts if a need is felt.

l) Co-ordinate all action for decontamination and make fit for re-entry.

m) Arranges for giving "All clear" signal to announce conclusion of the emergency.

n) Arranges for preservation of evidences for further investigations.

8.3 Role of Works Incident Controller (W.I.C) – Dy.Head (Prod.)/ Shift-in- charge:

a) On receipt of information about the emergency he will reach the scene of emergency. In the absence of Dy.Head production, the next to him will act as works incident controller.

b) After assessing the situation to initiate action for safe shutdown of plant, controlling the emergency and ensuring safety of the plant personnel.

c) Informs 'Site Controller' about the situation for planning further action and acts according to the instruction of the site controller.

e) Advises the fire fighting crew about the methods and precautions.

f) Ensure that all the personal protective equipments, tools and appliances are available.

g) Co-ordinates action regarding evacuation of persons from site to assembly point.

h) Oversees all activities regarding rescue, search and transportation.

8.4 Role of Telephone Operator:

a) On hearing the emergency siren and public announcement, he should make system free.

b) Do not give the information to outside agency with out consulting WMC.

c) Receive the information from outside and inform to WMC then and there.

d) Inform statutory authorities as per the instruction of WMC or Deputy Head Personnel (Co-ordinator Liaison).

8.5 Role of Shift Supervisor of all Plants:

a) They report to W.I.C on hearing the emergency siren.

b) The Shift-in-charge of the affected plant attends to the plant needs.

c) The Shift-in-charge of other plants will assume responsibilities as per the function of teams.

8.6 Role of Dy. Head (Services) – Co-ordinator - Communications:

a) On hearing about the emergency report at the control centre and site controller.

b) He will maintain the communication link with the incident controller.

c) Based on the information received he will interact with site controller decide and communicate the further action to the concerned.

d) Maintains contact with the fire fighting crew, rescue team, security, first aid requirements, evacuation requirements, etc.

e) Maintain the inventory of items in the control centre.

f) Ensures availability of runners in case of power failure.

g) He also obtains the prevailing meteorological data from the local offices.

h) He maintains log of the events.

8.7 Role of Dy. Head (Per. & Admn.) – Co-ordinator – Liason & Transport:

a) He will report to the Site Controller.

b) Under instructions from site controller, he interacts with statutory authorities like police, factory inspectorate, etc.

c) He will obtain information about head count at assembly points.

d) Interacts with the first aid/medical officer and ensures proper attention to the causalities and ensures additional help as required.

e) Co-ordinates with security for control of the traffic movement.

f) Ensures that necessary refreshments and welfare measures are provided for the people.

g) He informs the relatives of the injured about the condition.

h) In the event of fatalities he will co-ordinate all the formalities.

i) He will co-ordinate all relief/ rehabilitation measures.

j) On receipt of the emergency he will intimate the incident controller about his arrival.

k) He remains at the main entrance & makes all arrangements for transport.

l) Co-ordinates actions for additional vehicle requirements and ensures proper condition of ambulance.

m) He will also ensure adequate stock of fuel.

n) He will be in touch with emergency co-ordinator (Communications) and informs about the position on transportation of the injured to First Aid/Hospital and transportation of evacuated people.

8.8 Role of Security Officer:

On hearing the siren and public announcement the security officer should initiate the following action:

a) Close the main gate and restrict the men movement.

b) Went round the plant and evacuate the peoples.

c) Arrange to park the vehicle in a safe location.

d) Receive the out side agencies and take them to conference hall.

e) Guide the external fire fighters and mutual help team to reach the Scene of emergency.

f) Helping personnel department for head count.

8.9 Role of Dy.Head (Safety)– Fire Fighting & First aid:

a) He reports to W.I.C at the scene of emergency.

b) Assesses the situation and in consultation with W.I.C decides the plan of action to fight the emergency.

c) Co-ordinates all fire fighting and other activities.

d) Ensures adequate supplies of fire fighting requirements and personal protective equipments.

e) Maintains close contact with W.I.C and advises him about the mutual aid need, etc.

f) Co-ordinates all rescue and first aid operations and also ensure proper medical attention in consultation with communication co-ordinator and coordinator –Liaison and Transport.

8.10 Role of Medical Officer/Para Medical Staff:

a) On receipt of information reports at first aid centre.

b) Checks up and confirm availability of all essential medicines, dressings, stretchers, etc.

c) Arranges for necessary first aid for the injured.

d) Co-ordinates with the control centre and advises about persons requiring medical treatment.

e) Establishes contact with medical officers of Government and other private hospital and intimate them in advance about the injured people being sent to them.

f) Arranges for Antidotes, wherever necessary and also ensures that this is made available to outside hospitals also in case they don't have stocks.

8.11 Role of Manager (Environment) - Co-ordinator – effluents and toxic:

a) Reports to the scene of emergency and report to the incident controller.

b) Assesses the situation and in consultation with W.I.C. decides the plan of action to fight the emergency

c) Arranges for the effective collection and handling of effluents arising out of the emergency operations such as dilution or neutralization.

d) Initiates effective disposal procedures for wastes and toxic materials and advises W.I.C. in this matter.

e) Monitoring the exposure limit of the chemicals and inform to WIC then and there to normalize the situation.

f) Intimate incident controller on the need for additional requirements of resources and manpower.

EMERGENCY FACILITIES

9.0 EMERGENCY FACILITIES:

9.1 Emergency Control Centre (E.C.C):

It is necessary that all directions and instructions have to be issued from one particular place and this place must be safe and is unlikely to be affected from the likely points of hazard and it must be easily approachable. The room adjacent to the Security Office near the Main Gate is designated as Emergency Control Centre.

9.2 The following facilities are available at the control centre.

a) Intercom and External Telephones

b) Walkie-talkie

c) Public Addressing System with cordless/connected mic system to make announcement to all areas in the factory

d) Factory lay out plan.

e) Plan indicating hazardous inventories, Control room, Assembly Points, Escape Routes, Sources of safety equipments, Fire fighting appliances etc.

f) Address and telephone numbers of key personnel/essential employees.

g) Address and telephone numbers of District Emergency Authorities like:

Dist. Collector
Superintendent of Police
Dist. Medical Officer
Nearest Police Station
Primary Health Centre
Municipal Commissioner
Govt. and Private Hospitals
ESI Dispensary
Home Guards
Dist. Vertinery Officer
Voluntary Organizations
Regional Transport Officers.

i) Address and telephone numbers of neighboring industries and contact persons.

j) Address and telephone numbers of outside experts/organisations.

k) Address and telephone numbers of mutual aid organisations along with the list of materials available.

l) List of first aiders , fire fighters and evacuation team crew.

m) Chemical fact sheets and material safety data sheets.

n) List of available personnel protective equipments.

o) List of fire fighting facilities available.

p) Demographic data around the factory and meteorological data.

q) Emergency medical management procedures.

r) Copies of On-site Emergency Plan.

s) One set of complete personal protective equipments and respiratory protection like SCBA.

t) Fire proximity suit complete with hood, gloves and boots.

u) Two sets of fire jel blankets.

v) Data about the daily attendance and people working in hazardous areas.

9.3 Assembly Points:

The area in front of Administration building is designated as Assembly Point. All persons who are not connected with the emergency will reach here by proper Escape Route and await instructions regarding evacuation & further action.

9.4 Emergency Escape:

The elevated floors in all the process plants are provided with two stairs so that a minimum of one will be available during emergency. All the ground level blocks are open and ventilated and provide adequate egress. Emergency Escape route details displayed in all plant entrance area.

9.5 Wind Indicators:

Wind Indicators are provided at six places, one on the top of Quality Control Building, the second one on the new ETP Block, the third one on the Pharma plant, the fourth one in between packing and pilot plant, the fifth one on the 2D Block and the sixth one on the contractor toilet area as guidance for the people to choose the escape routes based on wind direction.

Wind socks layout enclosed – **Annexure 10**

9.6 Occupational Health Centre:

The Occupational Health Centre is working round the clock and is manned by qualified first aiders.

The center is provided with medical Oxygen cylinder and breather cups. Spare medical oxygen cylinder is kept as spare.

Adequate stock of essential medicines are maintained. About 50 persons have been trained in First Aid and they will be available in all shifts.

A dedicated ambulance vehicle with medical oxygen cylinder is maintained for transporting the injured/sick.

In addition a bus with a capacity of 52 passengers, Qualis and Sumo are available and can be pressed into service.

A list of first aid material and medicines that are maintained is included in the **Annexure - 11**

9.7 A ring main hydrant system is available and a layout plan and detail are given in **Annexure-12**

The system consists of the following

Dedicated static water storage	: 358 m^3 & Interlink with Formulation unit
Hydrant Single	: 28 Nos
Fire escape	: 11 Nos
Multi purpose nozzle	: 2 Nos.
Oscillating nozzle	: 1 No.
360^0 Fire hydrant monitors	: 7 Nos.
Aqueous film forming foam	: 1500 liters
Foam making nozzle	: 05 Nos
Mobile foam trolley (100 liters capacity)	: 01 Nos

Adequate fire hoses, branch pipes and spray nozzle provided.

9.8 A fire alarm system with manual call points are provided for the entire plant.

No. of call points	: 56 Nos
No. of Hooter	: 40 Nos
No. of smoke & heat detectors	: 215 Nos

The layout plan is enclosed in **Annexure-13**

9.9 Fire extinguishers of different types are provided through out the plant and the location wise detail is included in **Annexure-14**

9.10 Walkie – Talkie sets and mega phone are available.

10. MITIGATION PROCESS

The scope of this process is to bring building, equipments and damaged part of the land to operable condition.

The extinguishing media used for fighting the fire is Dry Chemical Powder (Sodium bi carbonate), Mechanical foam, Carbon di oxide and Water. In case of chemical spill or leakages, water with neutralizing agent is used in large amount.

In case of small fire: After extinguishing the fire, the equipment and the area is cleaned thoroughly and painted. The powder or foam used to extinguishing the fire is cleaned and send to ETP for further treatment. In case water is used, the contaminated water is collected in to an ETP collection tank and than treated accordingly.

In case of Major fire: In case of major fire, depending upon the chemicals involved large amount of extinguishers like Dry chemical powder, Mechanical foam, Special dry chemical powder and water is used to extinguishing the fire. The contaminated water is diverted to ETP collection tank for further treatment. The powder or foam spilled on the floor or coated over the near by equipment is cleaned and send to ETP for treatment.

The damaged equipment, walls and floors are repaired and painted to bring it to normal operating condition.

The damage of the equipment and building due major fire will be replacing or constructed newly for regular production.

In case of chemical spillage (Small): The chemical spillages are either absorbed with spill kit or contained with suitable neutralizing agent and washed thoroughly with water. The contaminated water is diverted into ETP collection tank for further treatment.

In case of major leakage of Chemicals:

44. **Leakage from the storage tank:** Leakage from the storage tanks is contained inside the dyke wall. After transferring the chemicals from leakage tank to spare tank, the contained chemicals inside the dyke is transferred to a suitable container-using pump. The area is neutralized with suitable neutralizing agent and washed thoroughly with water. The contaminated water is diverted to ETP collection tank for further treatment.

b. Leakage of Drums:

In case of leakage in drum storage area, the damaged drum can be isolated to a secondary containment and material can be transferred to a new drum. Then the spilled material is absorbed with spill kit and than with suitable neutralizing agent. The contaminated area is washed thoroughly with water and diverted to ETP collection tank for further treatment.

C. Leakage from pipelines:

The area will be barricaded immediately and attending the leakage by wearing suitable personal productive equipments. The contaminated area is neutralized with suitable neutralizing agent to bring back to neutral pH of 7.0.

D. Natural Calamity & External threats:

Materials, Equipments and Buildings damaged due to natural calamity like depression, lightening, earthquake and external threats can bring back to normal operating condition by reconstructing.

11. GENERAL

11.0 Training plans and Testing for effectiveness:

11.1 Awareness about OSEP:

On-Site Emergency Plan has been made familiar to all the employees including those in security people, visitors, Key Personnel and Essential Employees. Copies of the OSEP will be distributed to the entire key personal and will be prominently displayed at the plant for the benefit of all.

11.2 Mock Drill:

In order to provide practice to all the key personnel and essential employees so that they will be able to tackle any emergency mock drills are conducted regularly atleast once in 6 months.

Various observers will be enlisted for assessing the effectiveness of different emergency functions like communications, reporting time, search, rescue and treatment, assembly point, transportation, etc.

Based on the observations discussions are held with the concerned officials and necessary corrections will be implemented.

Emergency Co-ordinator (Safety) will be responsible for organizing Mock Drills.

11.3 Review and Updating:

OSEP would be reviewed periodically for its correctness and effectiveness. Any change that has been made in plant operations. Any change/addition of equipments and Products, change of Key personnel etc., will be incorporated and will be updated. The changes made in OSEP will be communicated to all concerned.

Emergency Co-ordinator (Safety) will be responsible for review of Onsite Emergency Plan.

11.4 Mutual Aid:

In certain cases of emergency it is possible that one may fall short of equipments / materials required for tackling emergency. It is also beneficial to enter into an understanding with the neighboring industries, so that resources available with them will be made available. This arrangement also helps in avoiding duplication and overstocking.

Emergency Coordinator (Liason officer) will be responsible for the arrangements and formatting a mutual-aid agreement.

KEY PERSONAL PHONE NUMBER

Name	Designation	Phone Number		Cell Number
		Office	Residence	
MR.S.ABHAYA KUMAR	EXECUTIVE DIRECTOR	044-24316717	044-24343386	-
CORPORATE OFFICE	-	91806784000	-	-
R&D	-	044-22451361	-	-
RESIDENCE NUMBER'S OF PONDY UNIT EXECUTIVES				
MR.E.KANNAPIRAN	VICE PRESIDENT	0413-2654104	-	7373734896
MR.J.MANICKAVASAGAM	GM	0413-2654103	-	7373739522
MR. AVANISH VERMA	GM - EHS	0413-2654106		7373734893
MR.R.RAMESH	DGM-EHS	0413-2654160		9578422252
MR.M.THANUMALAIYAN	GM- QC	0413-2654112	0413-2239406	7373736606
MR.D.KRISHNAMOORTHY	DGM	-	-	7373736608
MR. M.HARIVASUDEV	GM-QA	0413-2654116		7373734956
MR.A.SURESH	Sr.Mgr			7373735918
MR.R.KADAMBAN	AGM			7373738621
MR.V.SRIDHARAN	AGM			9698322242
MR.T.ASHOKKUMAR	AGM	-	-	7373736630
MR.S.JOTHI SUBRAMANIAN	AGM			7373736639
MR.PRAKASH	Sr. Mgr	0413-2654114		7373736854
N.SELVAKUMAR	Sr.Mgr – HR	-	0413-2290855	7373734790
MR.RAJKUMAR	Sr.Mgr	0413-2654161		7373738125
MR. M.SAGADEVAN	Sr. Mgr –ETP			7373738405
MR. A. RAMESH	Mgr			7373736616
MR.S.UNNIKRISHNAN	Mgr			7373736648
MR.C.P.RENGARAJAN	Sr.Mgr			7373736634
MR.THIRTHAGIRI	Mgr			7373736649
MR.SETHURAMAN	AGM			7373735978

EXTERNAL NUMBERS				
STRIDES SHASUN DISPENSARY	KALAPET	0413-1655136	-	-
FIRE STATION	KALAPET	0413-2655873	-	-
POLICE STATION	KALAPET	0413-2655142	-	-
PIMS	HOSPITAL	0413-2656271	-	-
INSPECTOR OF FACTORIES	PONDY	0413-2271868	-	-
POLLUTION CONTROL BOARD	PONDY	0413-2201256	0413-2201256	-
DISTRICT MEDICAL OFFICER	PONDY	0413-2249351-56	-	-
CHEMFAB ALKALIS LTD	PONDY	0413-2655873 0413-2655112 0413-2655116	-	-
FORMULATION	OFFICE	0413-2655946 0413-2655697	-	-
CUDDALORE-EXECUTIVE				
STRIDES SHASUN LIMITED	CUDDALORE	04142-239701-705.	-	-
SRC NUMBER'S				
RECEPTION	-	044-27479050 044-27476120 044-27476170	-	-
CHIEF SCIENTIFIC OFFICER	SRC	044-27476102	-	-
VP-HR	SRC	044-27476122	--	-

QUALIFIED AND EXPERIENCED PERSONAL IN HANDLING HAZARDOUS CHEMICALS

S.No:	NAME	DESIGNATION	QUALIFICATION	EXPERIENCE
1	Mr.E.KANNAPIRAN	Vice President – Operations	B.E	17 Years
2	Mr.J.MANICKAVASAGAM	GM – Operations & Projects	B.E	20 Years
3	Mr.R.PRAKASH	Sr. Mgr – RM stores & Commercial	M.Phill	24 Years
3	Mr.M.THANUMALAYAN	DGM – QC	B.Sc.	25 Years
5	Mr. R.RAMESH	DGM – Safety	B.E., D.I.S.	17 Years
6	Mr. V.SRIDHARAN	AGM – Production	M.Sc., M.B.A	24 Years
7	Mr. D.KRISHNAMURTHY	DGM-Production	B.Sc.	23 Years
8	Mr. B.MOHANKUMAR	DGM - Production	BE	25 Years
9	Mr. A.SURESH	Sr.Mgr	B.Tech	12 Years
10	Mr. M.SAGADEVAN	Sr.Mgr	M.Tech	11 Years

R.RAMESH
(DGM- EHS)

Nodal Officer

Strides Shasun Limited, A P I Pondicherry

Contact No: 0413-2654100-Ext-160/202
Intercom: 160/202
Cell Phone: 9578422252
Location: Admin building first floor
Residence:
Address: No.44, 7th Cross Street,
First floor, Teachers colony,
Moolakulam,
Puducherry.

RISK ASSESSMENT REPORT

For

Proposed Expansion of Bulk Drugs & Intermediates manufacturing Unit

BY

M/s. Strides- Shasun Pvt. Ltd

AT

Village: Kalapet

DISTRICT : Pondicherry

STATE : Pondicherry

REPORT PREPARED BY

(NABET Accredited vide Certificate No. NABET/EIA/1618/SA0015 &
MoEF Recognized Lab vide F. No. Q-15018/29/2007-CPW)
HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI

September 2017

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ABBREVIATIONS

IMD	India Meterological Department
ALARP	As Low As Reasonably Practical
TNO	Thai National Observatory
NFPA	National Fire Protection Association
LFL	Lower Flammability Limit
UFL	Upper Flammability Limit
AAQ	Ambient Air Quality

1 INTRODUCTION

1.1 Purpose of the report

The purpose of the study is to identify and assess those hazards and risks arising from proposed project “Expansion of Bulk Drugs manufacturing Facility for capacity of 9156TPA for 8 no’s products”. Strides Shasun has approval for the manufacturing capacity of 4800 TPA for 5 nos products.

Based on the available studies & plant layout, the potential scenarios which can cause significant consequences like Dispersion of vapour cloud, fire and explosion scenarios were identified.

The purpose of the study includes the following:

- To identify and assess those hazards and risks with NFPA rating.
- To eliminate or reduce to As Low As Reasonably Practical (ALARP) in terms of risk to human health, risk of injury, risk of damage to plant, equipment and environment, business interruption or loss etc.,
- To Suggest On-site and Off-site mitigative Measures.

1.2 Scope of the study

Hazard Identification and Risk Analysis including identification, screening of scenarios, consequence analysis of the various risk scenarios, recommendation and preparation of reports and relevant drawing showing damage and risk contours.

The scope of the study mainly involves:

- Identifications of Hazards
- Consequence modelling
  - ❖ Dispersion of Vapour cloud
  - ❖ Flash fire
  - ❖ Pool fire
  - ❖ Jet fire
  - ❖ Explosion
- Impact limits identifications
- Contour mapping of the risk on the layouts.
- Mitigating measures for handling and storage to reduce impacts & prevent incidents.

1.3 Methodology adopted

The Risk Assessment has been carried out by using the ALOHA software 5.4.5 (Aerial Locations of Hazardous Atmospheres) which was developed by office of Emergency management, EPA and Emergency Response Division, NOAA & PHAST Lite software 7.11 (Licence number 1603-120331(S-28502)) developed by DNV GL AS 2014.

1.4 Basic Facilities details

The basic facilities available in the layout are Solvent Storage tanks, Production block, Canteen, Amenities, Raw material store, Cooling tower, Multiple Effect Evaporator, Chilling plant, Old Boiler shed, Maintenance block, Drum Storage yard, Solvent recovery, Hydrant tank, Warehouse, 16 T.P.H Boiler, Pump room, Boiler shed and Admin block etc. The plant layout is shown in **Figure 1-1.**

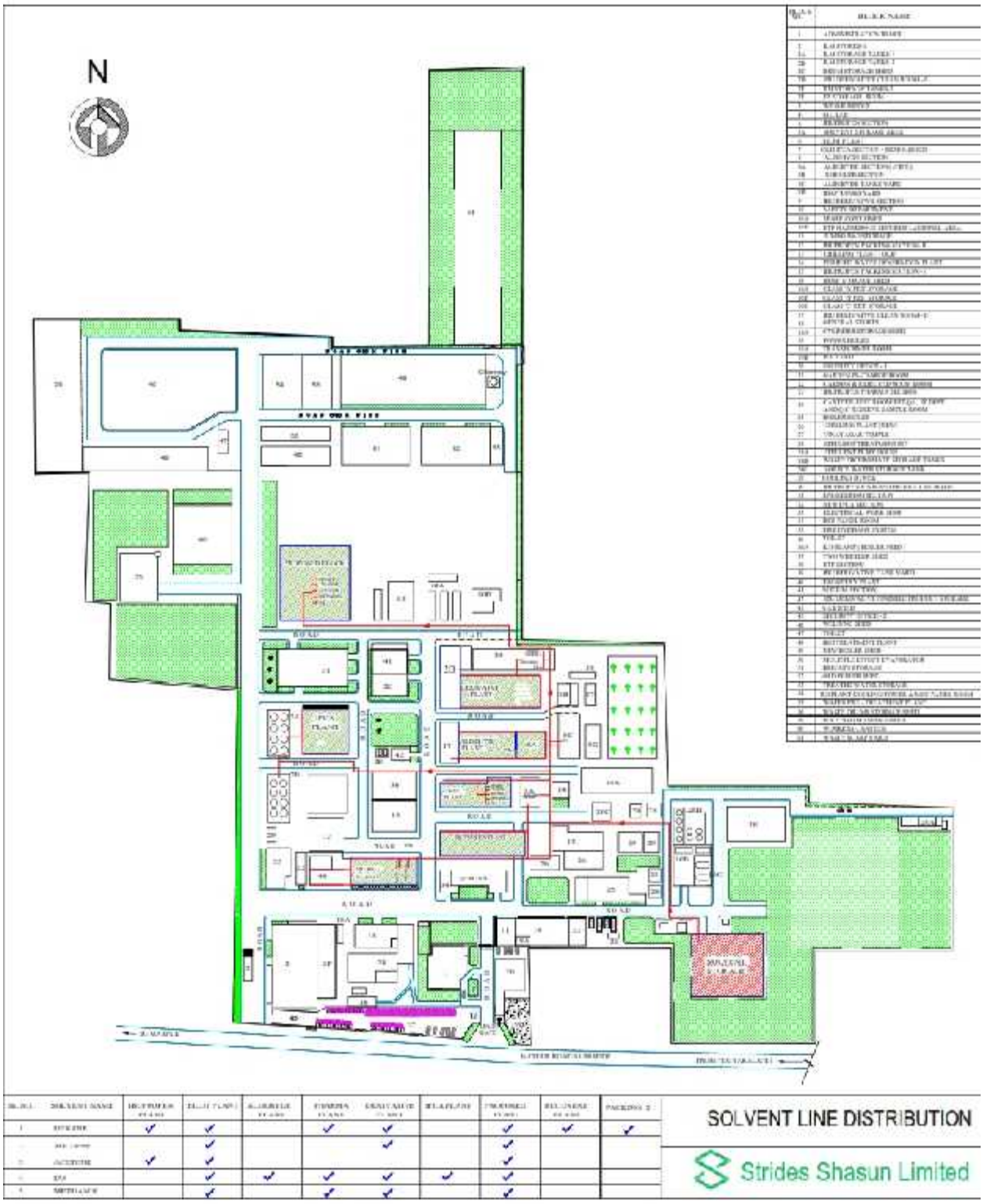


Figure 1-1 Plant Layout

1.5 Storage tank details

The details of the storage tank are shown in **Table 1-1.**

Table 1-1 Storage tank details

S. No	Solvent/ Chemical name	Block No	Type (Vertical/ Horizontal)	Dia. of the tank (m)	Height (m)	Volume (m^3)	Internal Temperature (°C)	Internal Pressure (bar)	Type of storage (above ground/ underground/ mounded)
1	IPA	2A	Vertical	2.89	3.8	25	Ambient	Atmospheric	Above Ground
2	Methanol	2A	Vertical	2.26	2.5	10	Ambient	Atmospheric	Above Ground
3	IPA	2A	Vertical	2.17	2.7	10	Ambient	Atmospheric	Above Ground
4	IPA	2A	Vertical	2.35	3	13	Ambient	Atmospheric	Above Ground
5	IPA	2A	Vertical	2.35	3	13	Ambient	Atmospheric	Above Ground
6	IPA	2A	Vertical	2.17	2.7	10	Ambient	Atmospheric	Above Ground
7	IPA	2A	Vertical	2.17	2.7	10	Ambient	Atmospheric	Above Ground
8	IPA	8C	Vertical	1.74	2.1	5	Ambient	Atmospheric	Above Ground
9	IPA	8C	Vertical	2.89	3.8	25	Ambient	Atmospheric	Above Ground
10	IPA	8C	Vertical	2.52	4	20	Ambient	Atmospheric	Above Ground
11	IPA	8C	Vertical	2.52	4	20	Ambient	Atmospheric	Above Ground
12	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
13	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
14	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
15	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
16	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
17	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
18	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
19	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
20	Acetone	5A	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
21	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
22	Acetone	5A	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
23	Acetone	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
24	Acetone	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
25	Acetone	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
26	Hexane	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
27	Hexane	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
28	Hexane	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
29	Hexane	5A	Vertical	2.18	2.67	10	Ambient	Atmospheric	Above Ground
30	Hexane	2	Vertical	2.06	1.5	5	Ambient	Atmospheric	Above Ground
31	Toluene	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
32	Toluene	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground

33	Toluene	39	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
34	Toluene	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
35	Toluene	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
36	Toluene	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
37	Hexane	39	Vertical	1.22	1.71	2	Ambient	Atmospheric	Above Ground
38	Hexane	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
39	Hexane	39	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
40	Hexane	39	Vertical	1.22	1.71	2	Ambient	Atmospheric	Above Ground
41	Hexane	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
42	Hexane	39	Vertical	1.09	1.6	1.5	Ambient	Atmospheric	Above Ground
43	Hexane	39	Vertical	1.09	1.6	1.5	Ambient	Atmospheric	Above Ground
44	Hexane	39	Vertical	1.01	1.5	1.2	Ambient	Atmospheric	Above Ground
45	IPA	39	Vertical	1.42	1.9	3	Ambient	Atmospheric	Above Ground
46	IPA	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
47	IPA	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
48	IPA	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
49	IPA	39	Vertical	1.70	2.2	5	Ambient	Atmospheric	Above Ground
50	IPA	39	Vertical	1.01	1.5	1.2	Ambient	Atmospheric	Above Ground
51	IPA	39	Vertical	1.01	1.5	1.2	Ambient	Atmospheric	Above Ground
52	Methanol	39	Vertical	1.82	2.31	6	Ambient	Atmospheric	Above Ground
53	Methanol	39	Vertical	1.22	1.7	2	Ambient	Atmospheric	Above Ground
57	Hexane	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
58	Hexane	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
59	Hexane	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
60	IPA	16A	Horizontal	4.34	2.03	30	Ambient	Atmospheric	Under ground
61	IPA	16A	Horizontal	4.34	2.03	30	Ambient	Atmospheric	Under ground
62	IPA	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
63	Toluene	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
64	Methanol	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
65	Acetone	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground
66	Acetone	16A	Horizontal	3.19	2	16	Ambient	Atmospheric	Under ground

1.6 Pipeline details

All the pipelines operated are at ambient temperature and atmospheric pressure conditions only. The details of the pipelines are shown in

Table 1-2 Pipeline details (Pipeline connected with storage tank)

S. No	Pipe Name	Dia (NB)	Length (m)	Chemical Flowing	Pipeline from to details	Block from to details
1.	HMDP-01	40	233	Methanol	UG Tank to Derivative Day tank	16A -B39
2.	HMDP-02	40	104	Methanol	Derivative Day tank to Derivative Outside Plant Header	B39-B09
3.	HMDP-03	40	60	Methanol	Derivative plant OH to Plant Inside Equipments	B09 OH-Plant Inside
4.	HTDP-01	40	233	Toluene	UG Tank to Derivative Day tank	16A -B39
5.	HTDP-02	40	104	Toluene	Derivative Day tank to Derivative Outside Plant Header	B39-B09
6.	HTDP-03	40	60	Toluene	Derivative plant OH to Plant Inside Equipments	B09 OH-Plant Inside
7.	HTDP-04	25	95	Toluene	Derivative plant to Day tank	B09-B39
8.	HIDP-01	40	233	IPA	UG Tank to Derivative Day tank	16A-B39
9.	HIDP-02	40	104	IPA	Derivative Day tank to Derivative Outside Plant Header	B39-B09
10.	HIDP-03	40	60	IPA	Derivative plant OH to Plant Inside Equipments	B09 OH-Plant Inside
11.	HIDP-04	25	75	IPA	Derivative plant to Day tank	B09-B39
12.	HHDP-01	40	233	Hexane	UG Tank to Derivative Day tank	16A-B39
13.	HHDP-02	40	104	Hexane	Derivative Day tank to Derivative Outside Plant Header	B39-B09
14.	HHDP-03	40	60	Hexane	Derivative plant OH to Plant Inside Equipments	B09 OH-Plant Inside
15.	HHDP-04	25	85	Hexane	Derivative plant to Day tank	B09-B39
16.	HHDP-05	40	90	Hexane	Ibu Day tank area to derivative day tank	B5A-B39
17.	HIB-01	40	7	IPA	UG Tank to Aldehyde Day tank	16A-B8C

18.	HIB-02	40	113	IPA	Aldehyde Day tank to Aldehyde Outside Plant Header	B8C-B08
19.	HIB-03	40	140	IPA	Aldehyde plant OH to Plant Inside Equipments	B08 OH-Plant Inside
20.	HIB-04	40	120	IPA	Ald plant to Day tank	B08-B8C
21.	HIA-01	40	151	IPA	UG Tank to IPCA Day tank	16A-B2A
22.	HIA-02	40	25	IPA	IPCA Day tank to IPCA Outside Plant Header	B2A-B32
23.	HIA-03	40	80	IPA	IPCA plant OH to IPCA Plant Inside Equipments	B32 OH-Plant Inside
24.	HIA-04	40	90	IPA	IPCA plant to Day tank	B32-B2A
25.	HHD-01	40	118	Hexane	Ibu Day tank to Pharma Plant	B5A-23
26.	HHD-02	40	130	Hexane	Pharma Day tank to Pharma Outside Plant Header	B23
27.	HHD-03	40	115	Hexane	Pharma plant OH to Plant Inside Equipments	B23
28.	HMD-01	40	256	Methanol	UG Tank to Pharma Day tank	16A-B23
29.	HMD-02	40	60	Methanol	Pharma Day tank to Plant Inside Equipments	B23
30.	HHPS-01	40	45	Hexane	Pharma plant to Packing 2	B23-B12
31.	HHPS-03	40	26	Hexane	Packing 2 plant OH to Packing 2 plant Inside Equipments	B12
32.	HHC-01	40	8	Hexane	UG Tank to Ibu Day tank	16A-B5A
33.	HHC-02	40	122	Hexane	Ibu Day tank to Ibu Outside Plant Header	B5A-B5
34.	HHC-03	40	130	Hexane	Ibu plant OH to Plant Inside Equipments	B5 OH- Plant inside
35.	HAC-01	40	8	Acetone	UG Tank to Ibu Day tank	16A-B5A

36.	HAC-02	40	122	Acetone	Ibu Day tank to Ibu Outside Plant Header	B5A-B5
37.	HAC-03	40	130	Acetone	Ibu plant OH to Plant Inside Equipments	B5 OH- Plant inside
38.	HAC-04	40	100	Acetone	Ibu plant to Day tank	B5 OH-B5A
39.	HMPP-01	40	55	Methanol	UG Tank to Pilot plant Day tank	16A -B06
40.	HMPP-02	40	0	Methanol	Pilot Day tank to Pilot Outside Plant Header	B06
41.	HMPP-03	40	40	Methanol	Pilot plant OH to Plant Inside Equipments	B06 OH-Plant Inside
42.	HTPP-01	40	55	Toluene	UG Tank to Pilot plant Day tank	16A -B06
43.	HTPP-02	40	0	Toluene	Pilot Day tank to Pilot Outside Plant Header	B06
44.	HTPP-03	40	45	Toluene	Pilot plant OH to Plant Inside Equipments	B06 OH-Plant Inside
45.	HIPP-01	40	55	IPA	UG Tank to Pilot plant Day tank	16A -B06
46.	HIPP-02	40	0	IPA	Pilot Day tank to Pilot Outside Plant Header	B06
47.	HIPP-03	40	43	IPA	Pilot plant OH to Plant Inside Equipments	B06 OH-Plant Inside
48.	HHPP-01	40	55	Hexane	UG Tank to Pilot plant Day tank	16A -B06
49.	HHPP-02	40	0	Hexane	Pilot Day tank to Pilot Outside Plant Header	B06
50.	HHPP-03	40	42	Hexane	Pilot plant OH to Plant Inside Equipments	B06 OH-Plant Inside
51.	HAPP-01	40	55	Acetone	UG Tank to Pilot plant Day tank	16A -B06
52.	HAPP-02	40	0	Acetone	Pilot Day tank to Pilot Outside Plant Header	B06
53.	HAPP-03	40	50	Acetone	Pilot plant OH to Plant Inside Equipments	B06 OH-Plant Inside

54.	HMPB-01	40	167	Methanol	UG Tank to Proposed plant Day tank	16A -Proposed Block T.Y
55.	HMPB-02	40	250	Methanol	Proposed plant Day tank to Proposed Plant Outside Header	Proposed Block T.Y -OH
56.	HMPB-03	40	400	Methanol	Proposed plant OH to Plant Inside Equipments	OH-Plant Inside
57.	HMPB-04	40	400	Methanol	Proposed Plant inside - Proposed Plant Storage Area	Plant Inside - Proposed BlockT.Y
58.	HTPB-01	40	167	Toluene	UG Tank to Proposed plant Day tank	16A -Proposed Block T.Y
59.	HTPB-02	40	250	Toluene	Proposed plant Day tank to Proposed Plant Outside Header	Proposed Block T.Y -OH
60.	HTPB-03	40	400	Toluene	Proposed plant OH to Plant Inside Equipments	OH-Plant Inside
61.	HTPB-04	40	250	Toluene	Proposed Plant inside - Proposed Plant Storage Area	Plant Inside - Proposed BlockT.Y
62.	HIPB-01	40	167	IPA	UG Tank to Proposed plant Day tank	16A -Proposed Block T.Y
63.	HIPB-02	40	250	IPA	Proposed plant Day tank to Proposed Plant Outside Header	Proposed Block T.Y -OH
64.	HIPB-03	40	400	IPA	Proposed plant OH to Plant Inside Equipments	OH-Plant Inside
65.	HIPB-04	40	270	IPA	Proposed Plant inside - Proposed Plant Storage Area	Plant Inside - Proposed BlockT.Y
66.	HHPB-01	40	167	Hexane	UG Tank to Proposed plant Day tank	16A -Proposed Block T.Y
67.	HHPB-02	40	250	Hexane	Proposed plant Day tank to Proposed Plant Outside Header	Proposed Block T.Y -OH
68.	HHPB-03	40	400	Hexane	Proposed plant OH to Plant Inside Equipments	OH-Plant Inside
69.	HHPB-04	40	290	Hexane	Proposed Plant inside - Proposed Plant Storage Area	Plant Inside - Proposed Block T.Y
70.	HAPB-01	40	167	Acetone	UG Tank to Proposed plant Day tank	16A -Proposed Block T.Y
71.	HAPB-02	40	250	Acetone	Proposed plant Day tank to Proposed Plant Outside Header	Proposed Block T.Y -OH

72.	HAPB-03	40	400	Acetone	Proposed plant OH to Plant Inside Equipments	OH-Plant Inside
73.	HAPB-04	40	300	Acetone	Proposed Plant inside - Proposed Plant Storage Area	Plant Inside - Proposed Block T.Y
74.	HHR-01	40	36	Hexane	Ibu Day tank to Recovery Plant via pharma header	B5A-B 2B
75.	HHR-02	40	30	Hexane	Recovery Plant Day tank to Recovery Plant OH	B2B
76.	HHR-03	40	25	Hexane	Recovery Plant OH to Plant Inside Equipments	B2B-B40
77.	HHRC-01	40	146	Hexane	Recovery Plant to Ibu Day Tank	B2B-B5A
78.	HIBA-01	40	171	IPA	Aldehyde plant to IPCA plant Day tank	B08-B2A

2 RISK ASSESSMENT METHODOLOGY

2.1 Identification of hazards & release scenarios

A technique commonly used to generate an incident list is to consider potential leaks and ruptures of all process pipelines and vessels/tanks. The following data were collected to envisage scenarios:

- Solvent Tank conditions (Operating temperature, pressure)
- Dimensions of the storage tank and pipelines
- Atmospheric conditions viz. Temperature, Humidity and Wind direction

2.1.1 Selection

The goal of selection is to limit the total number of incident outcome cases to be studied to a manageable size. The purpose of incident outcome selection is to develop a set of incident outcomes that must be studied for each incident included in the finalized incident study list. Each incident needs to be considered separately. Using the list of incident outcomes the risk analyst needs to determine which may result from each incident. While the analyst can decide whether an incident involving the loss of a process chemical to the atmosphere needs to be examined using dispersion analysis because of potential toxic gas effects, what happens if the same material is immediately ignited on release.

2.1.2 Characterizing the Failures

Accidental release of flammable or toxic vapours can result in severe consequences. Delayed ignition of flammable vapours can result in blast overpressures covering large areas. This may lead to extensive loss of life and property. Toxic clouds may cover yet larger distances due to the lower threshold values in relation to those in case of explosive clouds (the lower explosive limits). In contrast, fires have localized consequences. Fires can be put out or contained in most cases; there are few mitigating actions one can take once a vapor cloud gets released. Major accident hazards arise, therefore, consequent upon the release of flammable or toxic vapors or BLEVE in case of pressurized liquefied gases. In an industry, main hazard arises due to storage and

handling of hazardous chemicals. To formulate a structured approach to identification of hazards and understanding of contributory factors is essential.

2.1.3 Inventory

Inventory Analysis is commonly used in understanding the relative hazards and short listing of release scenarios. Inventory plays an important role in regard to the potential hazard. A practice commonly used to generate an incident list is to consider potential leaks and major releases from fractures of pipelines and vessels containing sizable inventories. The potential vapor release (source strength) depends upon the quantity of liquid release, the properties of the materials and the operating conditions (pressure, temperature). If all these influencing parameters are combined into a matrix and vapor source strength computed for each release case, a ranking should become a credible exercise.

2.1.4 Loss of Containment

Liquid Release may be instantaneous. Failure of a vessel leading to an instantaneous outflow assumes the sudden appearance of such a major crack that practically all of the contents above the crack shall be released in a very short time.

The more likely event is the case of liquid release from a hole in a pipe connected to the vessel. The flow rate will depend on the size of the hole as well as on the pressure in front of the hole, prior to the accident. Such pressure is basically dependent on the pressure in the vessel.

The vaporization of released liquid depends on the vapor pressure and weather conditions. Such consideration and others have been kept in mind both during the initial listing as well as during the short listing procedure. Initial listing of all significant inventories in the process plants was carried out. This ensured no omission through in advertence.

2.1.5 Factors considered for identification of hazards

In any installation, main hazard arises due to loss of containment during handling of flammable and toxic chemicals. The Chemicals are classified according to the properties and hazard class given by National Fire Protection Association (NFPA) is responsible for

380 codes and standards that are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service and installation.

NFPA classification (Table 2-1) for Health, Flammability & Reactivity of a chemical is on a scale from 0-4 least to worst. As per the NFPA Rating on the scale from 0-4 the chemicals having 3 & 4 are considered are highly hazardous and considered for analysis.

Table 2-1 NFPA Classification

Health	**Fire**
0-No hazard	0-will not burn
1-can cause significant irritation	1- must be preheated before ignition occur
2-can cause temporary incapacitation or residual injury	2-must be heated or high ambient temperature to burn
3-can cause serious or permanent injury	3- can be ignited under almost all ambient
4-can be lethal	4-will vaporize and readily burn at normal temp

NFPA provides standard for the chemicals to reduce the risk of fire and other hazards which are mentioned in **Table 2-2.**

Table 2-2 Chemical properties and classification

S. No	**Chemical**	**Boiling Point (°C)**	**Flash point (°C)**	**NFPA Rating**		
				Fire	**Health**	**Reactivity**
1	Acetone	56.1	-17.7	3	1	0
2	Toluene	110.6	4.44	3	2	0
3	Hexane	68.8	-22.5	3	1	0
4	IPA (Iso Propanol)	84.1	11.6	3	1	0
5	Methanol	64.6	11.1	3	1	0

As per the NFPA rating, the fire hazard is observed in chemicals such as Acetone, Toluene, Hexane, Iso propanol and Methanol. The chemical such as acetone is stored in the underground storage tank.

2.2 Types of outcome events

In this section of the report we describe the probabilities associated with the sequence of occurrences which must take place for the incident scenarios to produce hazardous effects and the modelling of their effects.

Considering the present case the outcomes expected are

- Jet fire
- Flash Fire
- Vapour Cloud
- Pool Fire

2.2.1 Jet fire

Jet fire occurs when a pressurized release (of a flammable gas or vapour) is ignited by any source. They tend to be localized in effect and are mainly of concern in establishing the potential for domino effects and employee safety zones rather than for community risks.

The jet fire model is based on the radiant fraction of total combustion energy, which is assumed to arise from a point slowly along the jet flame path. The jet dispersion model gives the jet flame length.

2.2.2 Flash fire

A flash fire is the non-explosive combustion of a vapour cloud resulting from a release of flammable material into the open air, which after mixing with air, ignites. A flash fire results from the ignition of a released flammable cloud in which there is essentially no increase in combustion rate. The ignition source could be electric spark, a hot surface, and friction between moving parts of a machine or an open fire. Part of the reason for flash fires is that, flammable fuels have a vapour temperature, which is less than the ambient Temperature. Hence, as a result of a spill, they are dispersed initially by the negative buoyancy of cold vapors and subsequently by the atmospheric turbulence. After the release and dispersion of the flammable fuel the resulting vapour cloud is ignited and when the fuel vapour is not mixed with sufficient air prior to ignition, it results in diffusion fire burning. Therefore the rate at which the fuel vapour and air are mixed together during combustion determines the rate of burning in the flash fire.

The main dangers of flash fires are radiation and direct flame contact. The size of the flammable cloud determines the area of possible direct flame contact effects. Radiation

effects on a target depend on several factors including its distance from the flames, flame height, flame emissive power, local atmospheric transitivity and cloud size.

2.2.3 Vapour cloud

Vapour cloud is the result of flammable materials in the atmosphere, a subsequent dispersion phase, and after some delay an ignition of the vapour cloud. Turbulence is the governing factor in blast generation, which could intensify combustion to the level that will result in an explosion. Obstacles in the path of vapour cloud or when the cloud finds a confined area, as under the bullets, often create turbulence. Insignificant level of confinement will result in a flash fire. The vapour cloud will result in overpressures.

It may be noted that vapour cloud have been responsible for very serious accidents involving severe property damage and loss of lives.

2.2.4 Pool fire

This represents a situation when flammable liquid spillage forms a pool over a liquid or solid surface and gets ignited. Flammable liquids can be involved in pool fires where they are stored and transported in bulk quantities. Early pool fire was caused when the steady state is reached between the outflow of flammable material from the container and complete combustion of the flammable material when the ignition source is available. Late pool fires are associated with the difference between the release of material and the complete combustion of the material simultaneously. Late pool fires are common when large quantity of flammable material is released within short time.

2.3 Heat Radiation

The effect of fire on a human being is in the form of burns. There are three categories of burn such as first degree, second degree and third degree burns. The consequences caused by exposure to heat radiation are a function of:

- The radiation energy onto the human body [kW/m^2];
- The exposure duration [sec];
- The protection of the skin tissue (clothed or naked body).

The limits for 1% of the exposed people to be killed due to heat radiation, and for second-degree burns are given in the **Table 2-3**:

Table 2-3 Damages to Human Life Due to Heat Radiation

Exposure Duration	Radiation energy (1% lethality, kW/m2)	Radiation energy for 2nd degree burns, kW/m2	Radiation energy for first degree burns, kW/m2
10 sec	21.2	16	12.5
30 sec	9.3	7	4

The effects due to incident radiation intensity is given in **Table 2-4**

Table 2-4 Effects due To Incident Radiation Intensity

	TYPE OF DAMAGE
0.7	Equivalent to Solar Radiation
1.6	No discomfort for long exposure
4.0	Sufficient to cause pain within 20 sec. Blistering of skin (first degree burns are likely)
9.5	Pain threshold reached after 8 sec. second degree burns after 20 sec.
12.5	Minimum energy required for piloted ignition of wood, melting plastic tubing's etc.
37.5	Heavy Damage to process equipment

2.4 Type of damage

The actual results would be less severe due to the various assumptions made in the models arising out of the flame geometry, emissivity, angle of incidence, view factor and others. The radiative output of the flame would be dependent upon the fire size, extent of mixing with air and the flame temperature. Some fraction of the radiation is absorbed by carbon dioxide and water vapour in the intervening atmosphere. Finally the incident flux at an observer location would depend upon the radiation view factor, which is a function of the distance from the flame surface, the observer's orientation and the flame geometry.

Assumptions made for the study

- The lethality of a jet fire is assumed to be 100% for the people who are caught in the flame. Outside the flame area, the lethality depends on the heat radiation distances.

- For the flash fires lethality is taken as 100% for all the people caught outdoors and for 10% who are indoors within the flammable cloud. No fatality has been assumed outside the flash fire area.

2.5 Explosion

In case of vapour cloud explosion, two physical effects may occur:

1. A flash fire over the whole length of the explosive gas cloud;
2. A blast wave, with typical peak overpressures circular around ignition source.

For the blast wave, the lethality criterion is based on:

A peak overpressure of 0.1bar will cause serious damage to 10% of the housing/structures. Falling fragments will kill one of each eight persons in the destroyed buildings.

The following damage criteria may be distinguished with respect to the peak over pressures resulting from a blast wave is shown in **Table 2-5.**

Table 2-5 Effects of Overpressure

Peak Overpressure	Damage Type	Description
0.30 bar	Heavy Damage	Major damage to plant equipment structure
0.10 bar	Moderate Damage	Repairable damage to plant equipment & structure
0.03 bar	Significant Damage	Shattering of glass
0.01 bar	Minor Damage	Crack in glass

Assumptions for the study

- Overpressure more than 0.3 bar corresponds approximately with 50% lethality.
- An overpressure above 0.2 bar would result in 10% fatalities.
- An overpressure less than 0.1 bar would not cause any fatalities to the public.
- 100% lethality is assumed for all people who are present within the cloud proper.

3 CONSEQUENCE ANALYSIS

3.1 Scenarios possible

As large number of failure cases can lead to the same type of consequences, representative failure cases are selected for this analysis. The failure cases are based on conservative assumptions. Typically, failure models considered 100% catastrophic rupture of tanks. The scenarios are discussed one at a time.

3.2 Weather probabilities

3.2.1 Wind velocity & stability class

As per CPR 18E there are 6 representative weather classes are given in **Table 3-1**:

Table 3-1 Pasquill – Giffard Atmospheric Stability

S.No.	Stability Class	Weather Conditions
1	A	Very unstable - Sunny, light wind
2	A/B	Unstable - as with A only less sunny or more windy
3	B	Unstable - as with A/B only less sunny or more windy
4	B/C	Moderately unstable – moderate sunny and moderate wind
5	C	Moderately unstable – very windy / sunny or overcast / light wind
6	C/D	Moderate unstable – moderate sun and high wind
7	D	Neutral – little sun and high wind or overcast / windy night
8	E	Moderately stable – less overcast and less windy night
9	F	Stable – night with moderate clouds and light / moderate wind
10	G	Very stable – possibly fog

3.2.2 Weather input

The atmospheric data for the moderate and worst scenario is shown in **Table 3-2**

Table 3-2 Atmospheric data (Manual Input for the worst scenario)

Weather Conditions	Moderate	Worst Case
Wind speed (m/s)	1.5	5
Stability Class	D and F	D
Wind Direction	South west to North East	
Temperature (°C)	34	
Humidity (%)	0.73	
Source	IMD	

3.3 Accident scenarios for this project

3.3.1 Consequence analysis for the solvent tank considered

The input detail of day storage solvent tank is given in **Table 3-3**.

Table 3-3 Input details of storage tank

S. No	Chemicals	Diameter of the tank (m)	Height (m)	Volume (m^3)	Internal Temp (°C)	Internal Pressure (Kg/cm^2)	Type of storage (above ground/underground/ mounded)	Proposed/ Existing
1.	Acetone	2.18	2.67	10	Ambient	Atmospheric	Above the ground	Existing
2.	Toluene	1.7	2.2	5	Ambient	Atmospheric	Above the ground	Existing
3.	Hexane	2.18	2.67	10	Ambient	Atmospheric	Above the ground	Existing
4.	IPA	2.89	3.80	25	Ambient	Atmospheric	Above the ground	Existing
5.	Methanol	2.26	2.5	10	Ambient	Atmospheric	Above the ground	Existing

As per the NFPA rating, the fire hazard is observed in chemicals such as Acetone, Toluene, Hexane, Iso propanol and Methanol. The chemicals such as MDC have not observed any hazards. The chemical such as acetone is stored in the underground storage tank where the impacts are negligible and even risk contours maps are not generated.

The estimated distances due to leak of storage tanks are given in **Table 3-4**.

Table 3-4. Estimated distance due to leak of storage tank

S.No	Description	Event	Impact criteria	Consequence Distance (m)		
				Category 1.5/F	Category 5/D	Category 1.5/D
1	Leak of IPA Storage Tank	Dispersion of vapor cloud (ppm)	UFL (120000)	2.869	2.285	2.864
			LFL (20000)	15.594	4.326	14.969
			LFL Frac (10000)	21.26	8.829	22.04
		Jet Fire	4 kW/m^2	4.892	4.06	4.90
			12.5 kW/m^2	3.899	2.796	3.918
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Pool fire	4 kW/m^2	12.125	13.06	12.178
			12.5 kW/m^2	8.092	9.79	8.145
			37.5 kW/m^2	5.406	5.644	5.459
		Flash Fire	10000 ppm	21.26	8.83	22.04
			20000 ppm	15.5	4.32	14.96
		Explosion	0.02068 bar	60.06	Not Reached	46.58
			0.1379 bar	27.78	Not Reached	25.16
			0.2068 bar	25.84	Not Reached	23.87
2.	Leak of Methanol Storage Tank	Pool fire	4 kW/m^2	2.416	3.09	2.504
			12.5 kW/m^2	2.416	Not Reached	Not Reached
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Flash Fire	36500 ppm	0.485	0.470	0.527
			73000 ppm	0.35	0.33	0.37
3	Leak of Toluene Storage Tank	Pool fire	4 kW/m^2	4.506	4.89	4.45
			12.5 kW/m^2	3.29	4.02	3.3
			37.5 kW/m^2	2.41	3.08	2.5
		Flash Fire	6000 ppm	0.618	0.625	0.7086
			12000 ppm	0.47	0.46	0.514
4	Leak of Acetone Storage Tank	Pool fire	4 kW/m^2	2.354	3.04	2.44
			12.5 kW/m^2	2.354	3.04	2.44
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Flash Fire	13000 ppm	0.586	0.58	0.657
			26000 ppm	0.44	0.42	0.47

5	Leak of Acetone Storage Tank	Pool fire	4 kW/m^2	2.398	3.019	2.406
			12.5 kW/m^2	2.314	3.019	2.406
			37.5 kW/m^2	2.314	3.019	2.406
		Flash Fire	5250 ppm	0.643	0.642	0.743
			10500 ppm	0.483	0.477	0.54

CONTOUR MAPS

Scenario -1: Leak of Iso Propanol Storage tank

Case- 1 Dispersion of Vapor cloud

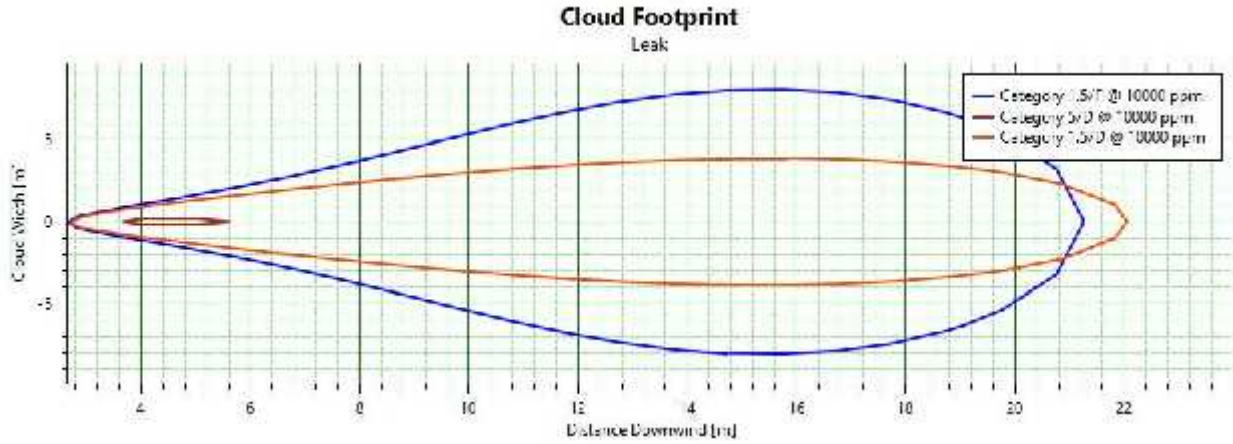


Figure 3-1 Dispersion of vapor cloud from Leak of Iso Propanol Storage tank

Case- 2 Jet Fire

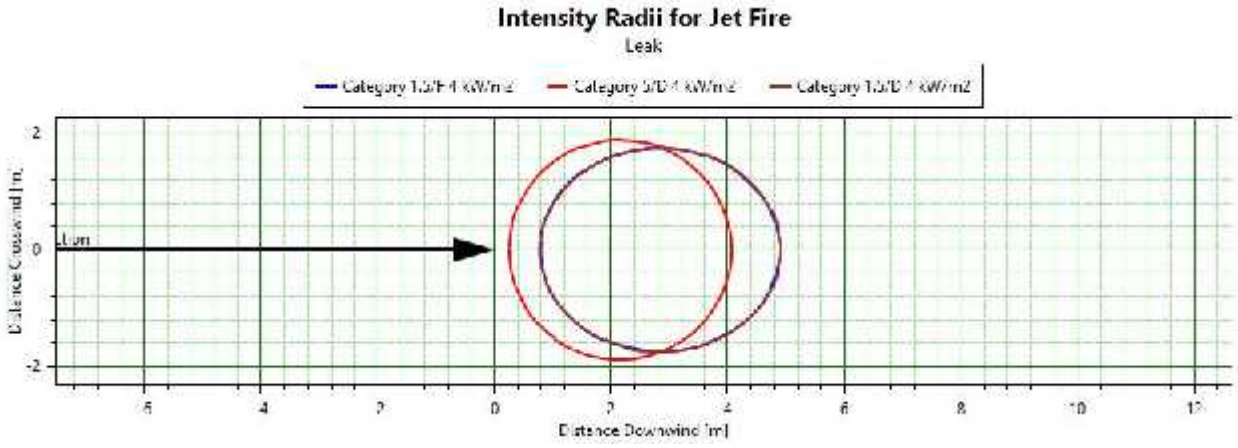


Figure 3-2 Jet Fire From Leak of Iso Propanol Storage tank

Case- 3 Pool fire

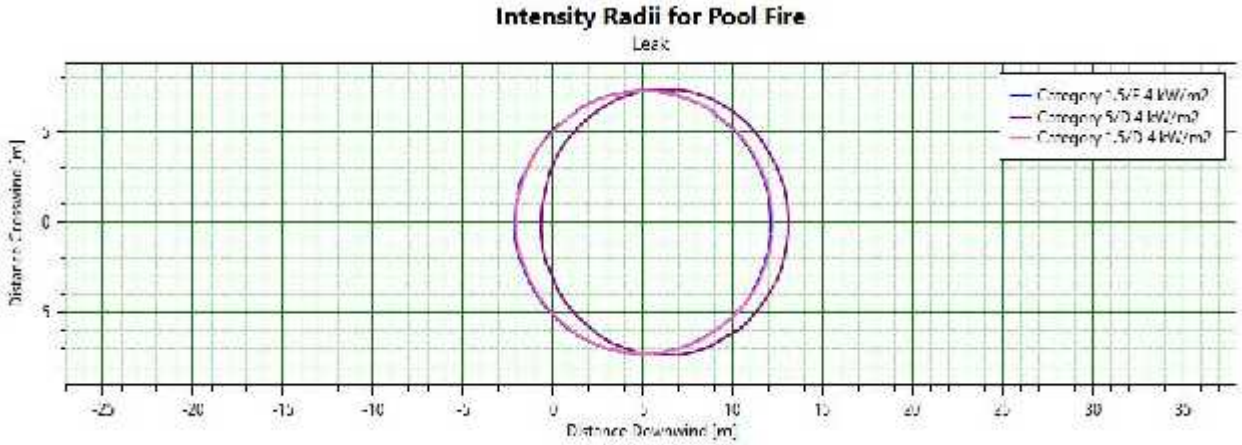


Figure 3-3 Pool Fire From Leak of Iso Propanol Storage tank

Case- 4 Flash fire

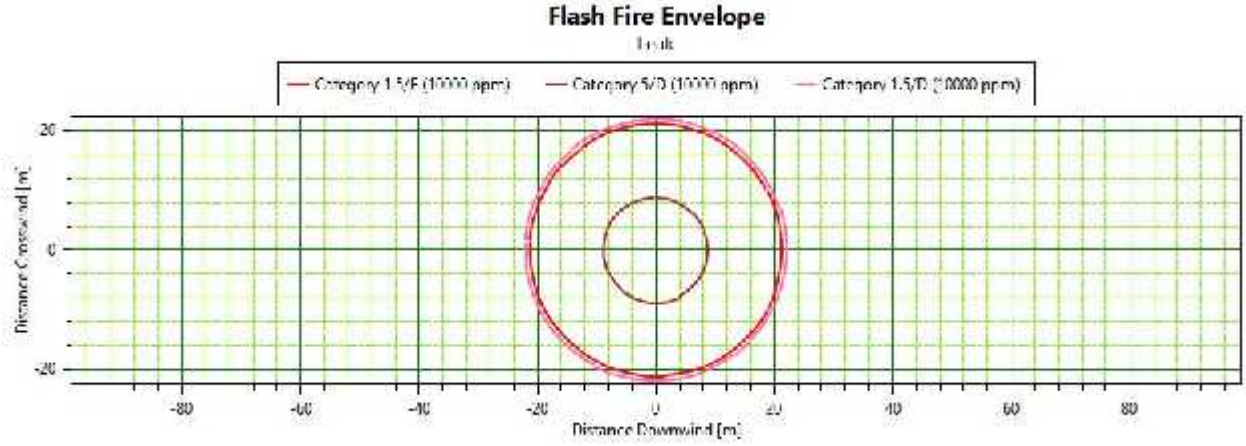


Figure 3-4 Flash Fire from Leak of Iso Propanol Storage tank

Case-5 Explosion

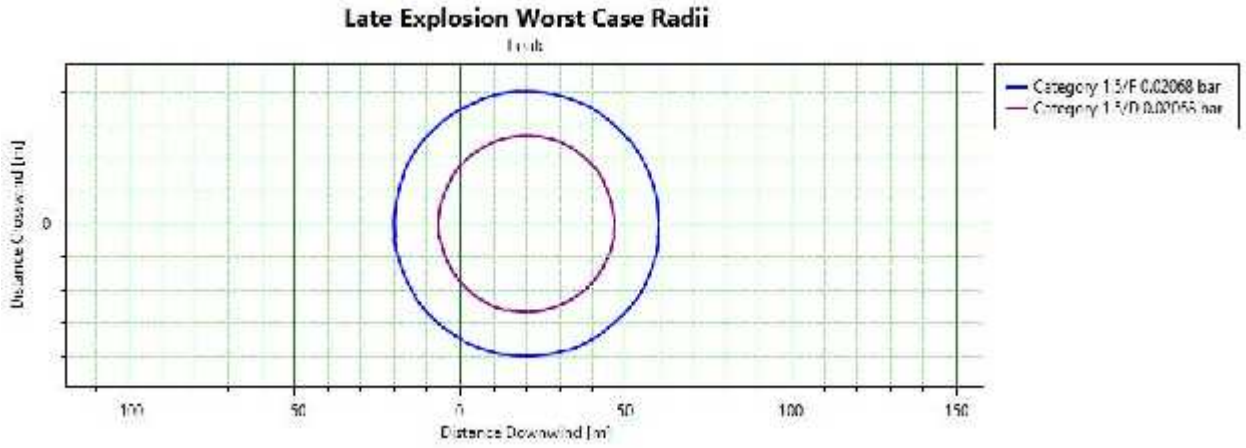


Figure 3-5 Explosion from leak of Iso Propanol Storage tank

CONTOUR MAPS

Scenario - 2: Leak of Methanol Storage tank

Case- 1 Late Pool fire

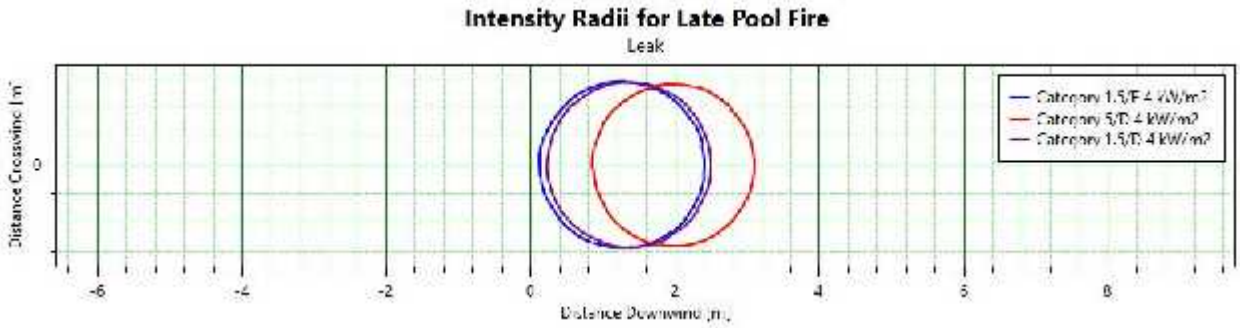


Figure 3-6 Pool Fire from Leak of Methanol Storage tank

Case- 2 Flash fire

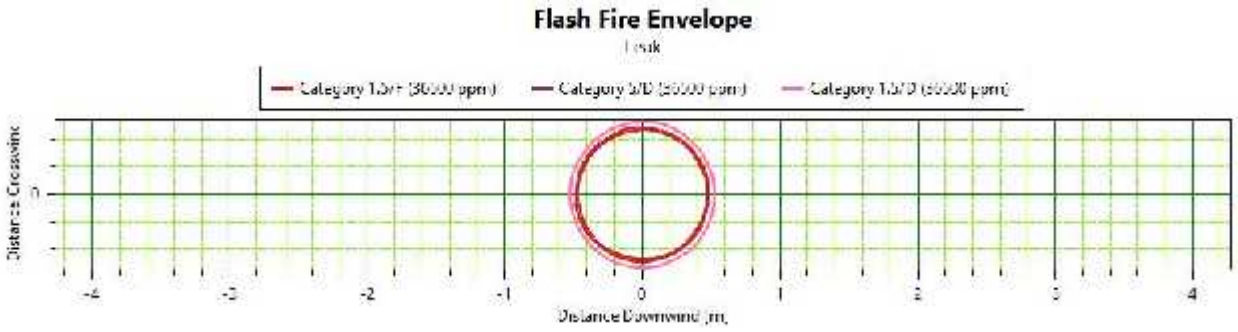


Figure 3-7 Flash Fire from Leak of Methanol Storage tank

CONTOUR MAPS

Scenario - 3: Leak of Toluene Storage tank

Case- 1 Late Pool fire

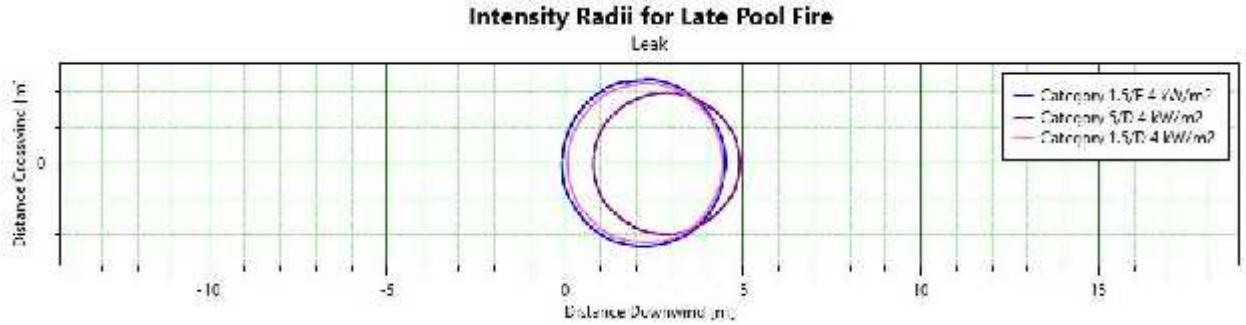


Figure 3-8 Pool Fire from Leak of Toluene Storage tank

Case- 2 Flash fire

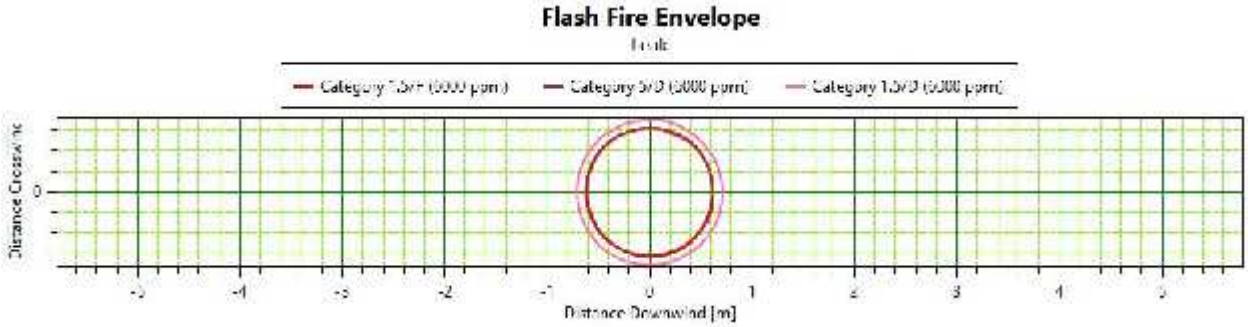


Figure 3-9 Flash Fire from Leak of Toluene Storage tank

CONTOUR MAPS

Scenario - 4: Leak of Acetone Storage tank

Case- 1 Late Pool fire

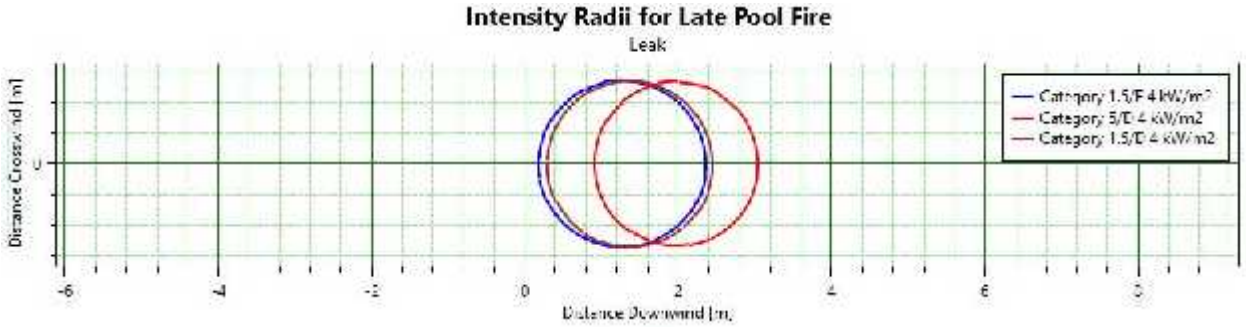


Figure 3-10 Pool Fire from Leak of Acetone Storage tank

Case- 2 Flash fire

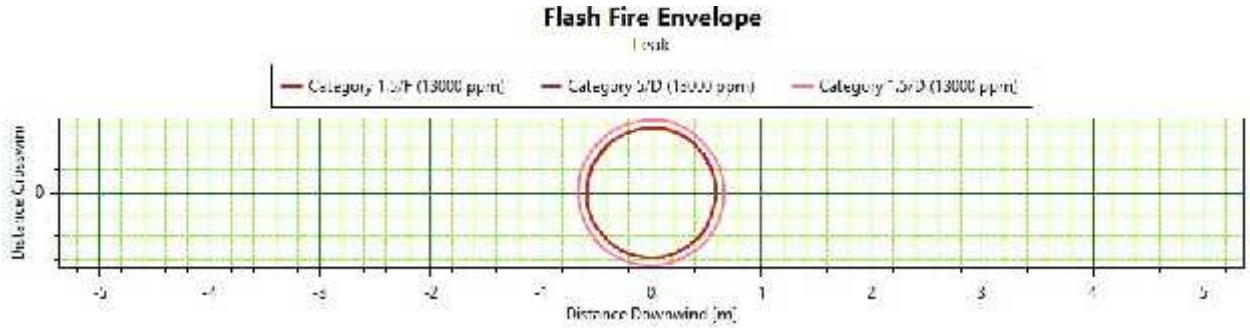


Figure 3-11 Flash Fire from Leak of Acetone Storage tank

CONTOUR MAPS

Scenario - 5: Leak of Hexane Storage tank

Case- 1 Late Pool fire

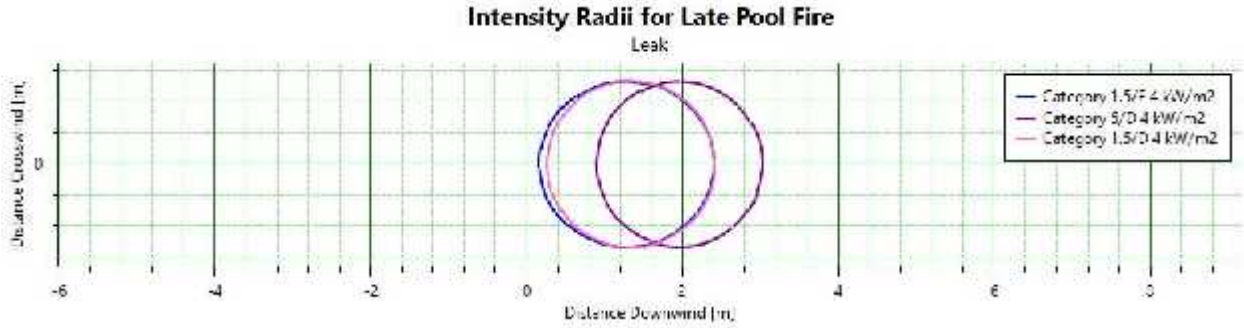


Figure 3-12 Pool Fire from Leak of Hexane Storage tank

Case- 2 Flash fire

Figure 3-13 Flash Fire from Leak of Hexane Storage tank

Table 3-5. Estimated distance due to Catastrophic rupture of storage tank

S.No	Description	Event	Impact criteria	Consequence Distance (m)		
				Category 1.5/F	Category 5/D	Category 1.5/D
1	Catastrophic Rupture of IPA Storage Tank	Dispersion of vapor cloud (ppm)	UFL (71000)	95.54	69.46	100.98
			LFL (12000)	187.66	154.07	197.44
			LFL Frac (6000)	225.73	212.49	240.480.
		Flash Fire	6000 ppm	225.73	212.49	240.48
			12000 ppm	187.66	154.07	197.44
		Late Explosion	0.02068 bar	793.71	715.516	790.71
			0.1379 bar	327.55	261.99	330.9
			0.2068 bar	300.64	240.2	305.65
2.	Catastrophic Rupture of Methanol Storage Tank	Late Pool fire	4 kW/m^2	66.69	68.51	66.43
			12.5 kW/m^2	41.69	47.53	41.49
			37.5 kW/m^2	26.68	26.20	26.513
		Flash Fire	36500 ppm	81.15	41.39	49.55
		Late Explosion	73000 ppm	44.31	26.23	30.49
			0.02068 bar	110.21	78.91	100.177
		Late Explosion	0.1379 bar	65.7849	37.589	48.15
			0.2068 bar	64.33	35.69	46.10
3	Catastrophic Rupture of Toluene Storage Tank	Dispersion of vapor cloud (ppm)	UFL (71000)	95.54	69.466	100.98
			LFL (12000)	187.66	154.07	197.44
			LFL Frac (6000)	225.73	212.49	240.48
		Flash Fire	6000 ppm	225.733	212.49	240.82
			12000 ppm	187.66	154.07	197.44
		Late Explosion	0.02068 bar	793.706	715.516	790.709
			0.1379 bar	327.556	261.994	330.907
			0.2068 bar	300.64	240.20	305.65

4	Catastrophic Rupture of Acetone Storage Tank	Dispersion of vapor cloud (ppm)	UFL (128000)	27.49	15.19	29.37
			LFL (26000)	75.99	49.41	83.17
			LFL Frac (13000)	108.56	68.06	128.35
		Pool fire	4 kW/m^2	128.677	131.62	128.01
			12.5 kW/m^2	78.88	86.6	78.43
			37.5 kW/m^2	40.88	49.40	40.58
		Flash Fire	13000 ppm	108.56	68.06	128.35
			26000 ppm	75.99	49.41	83.175
		Late Explosion	0.02068 bar	292.62	175.64	261.09
			0.1379 bar	135.61	76.82	133.79
			0.2068 bar	126.7	72.61	129.33
5	Catastrophic Rupture of Hexane Storage Tank	Dispersion of vapor cloud (ppm)	UFL (76800)	117.83	84.55	123.82
			LFL (10500)	239.33	195.49	248.52
			LFL Frac (5250)	284.52	267.93	299.61
		Flash Fire	5250 ppm	284.52	267.94	299.61
			10500 ppm	239.33	195.49	248.52
		Late Explosion	0.02068 bar	981.246	878.9	970.74
			0.1379 bar	409.14	328.39	411.85
			0.2068 bar	376.82	302.71	381.36

CONTOUR MAPS

<u>Scenario - 1: Catastrophic rupture of Iso Propanol Storage tank</u>

Case- 1 Dispersion of Vapor cloud

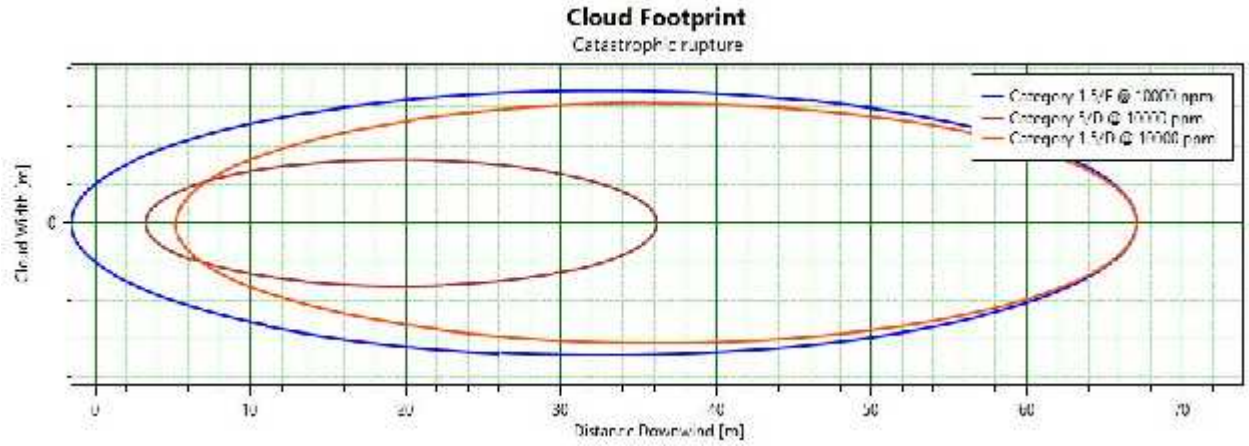


Figure 3-14 Dispersion of vapor cloud from Catastrophic rupture of Iso Propanol Storage tank

Case- 2 Late Pool fire

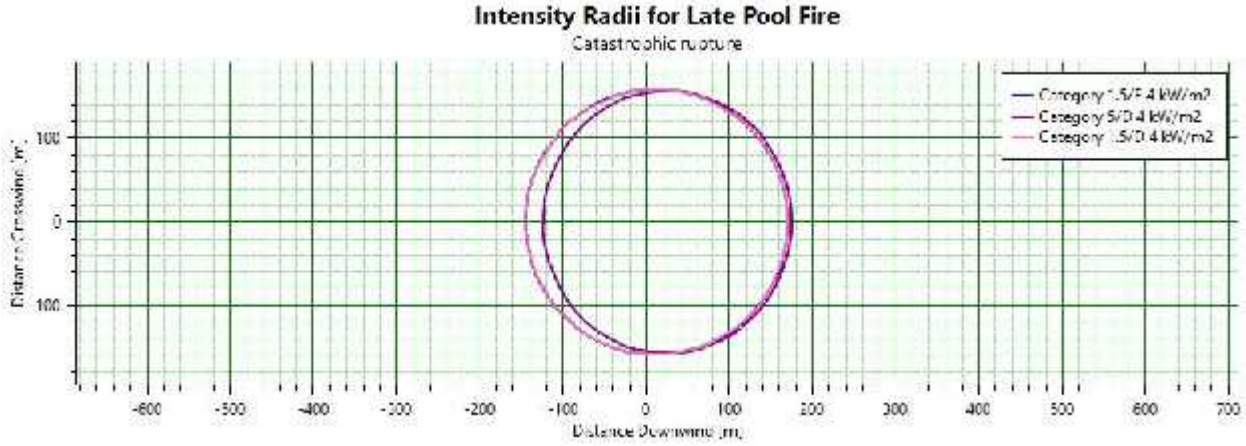


Figure 3-15 Late Pool Fire from Catastrophic rupture of Iso Propanol Storage tank

Case- 3 Flash fire

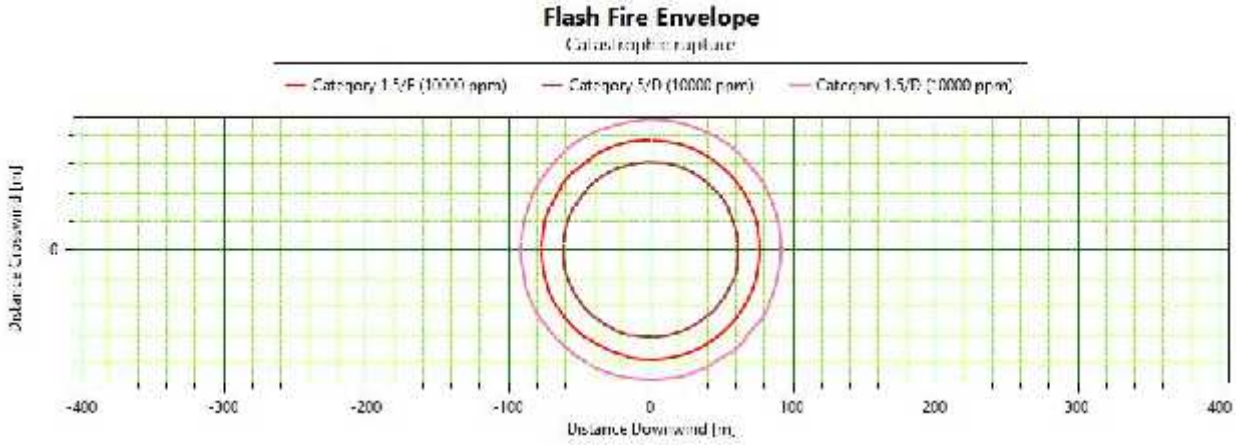


Figure 3-16 Flash Fire from Catastrophic rupture of Iso Propanol Storage tank

Case-4 Explosion

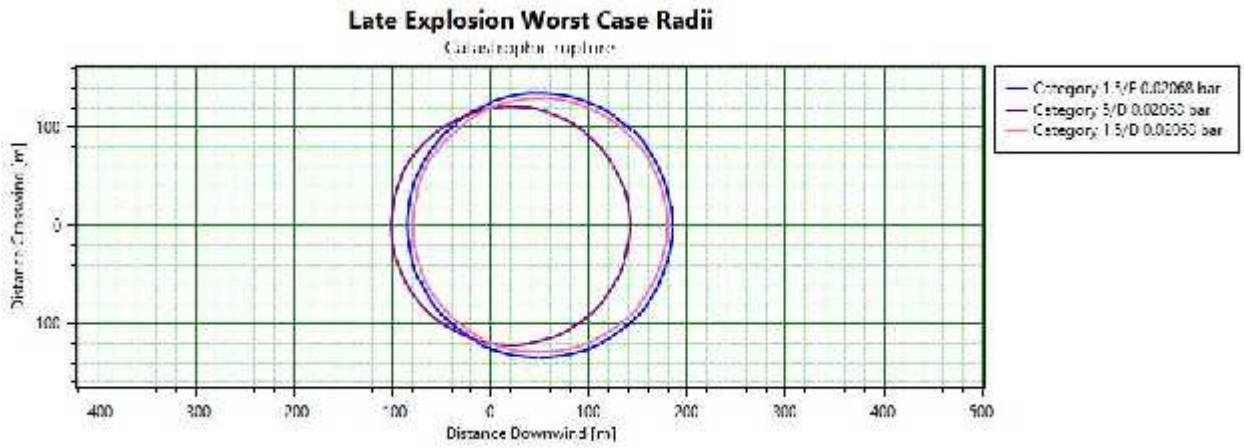


Figure 3-17 Explosion from Catastrophic rupture of Iso Propanol Storage tank

CONTOUR MAPS

Scenario - 2: Catastrophic rupture of Methanol Storage tank

Case- 1 Late Pool fire

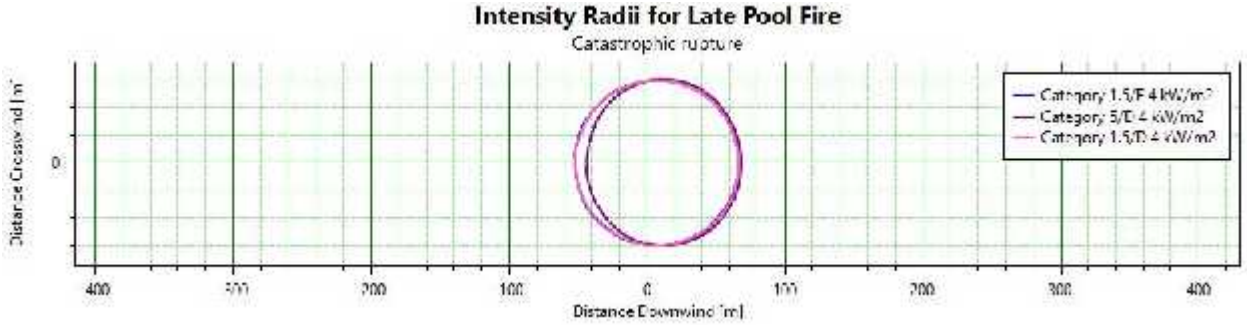


Figure 3-18 Late Pool Fire from Catastrophic rupture of Methanol Storage tank

Case- 2 Flash fire

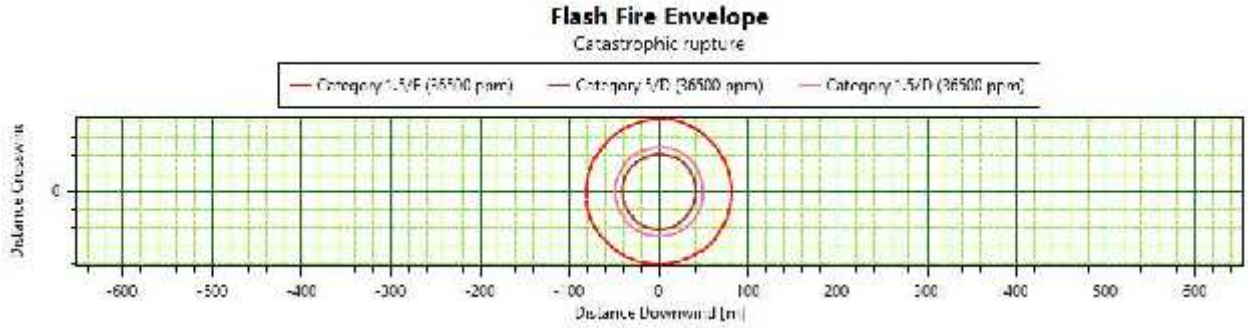


Figure 3-19 Flash Fire from Catastrophic rupture of Methanol Storage tank

Case-3 Explosion

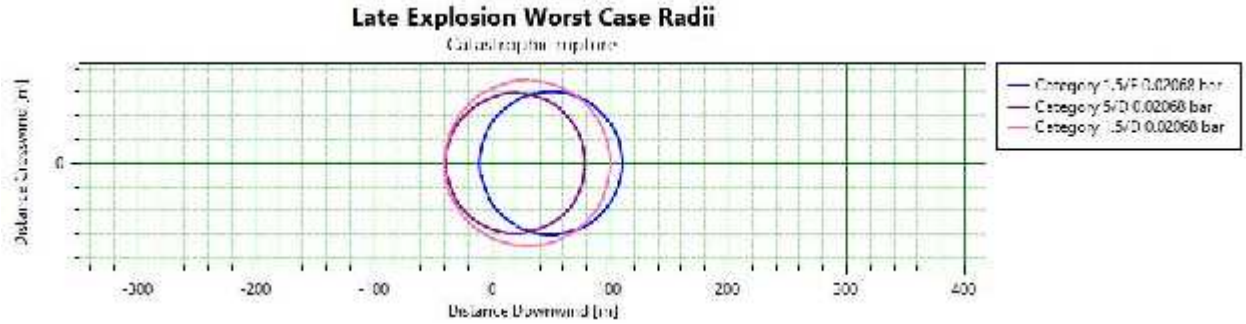


Figure 3-20 Explosion from Catastrophic rupture of Methanol Storage tank

CONTOUR MAPS

Scenario - 3: Catastrophic rupture of Toluene Storage tank

Case- 1 Dispersion of Vapor cloud

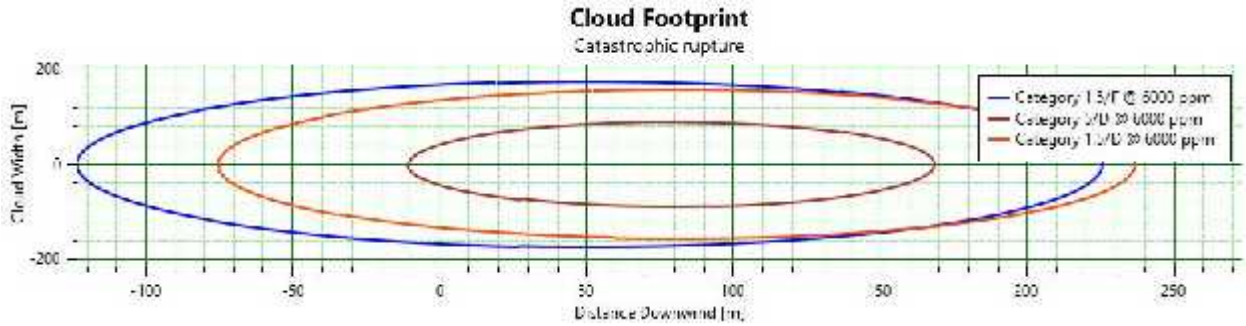


Figure 3-21 Dispersion of vapor cloud from Catastrophic rupture of Toluene Storage tank

Case- 2 Flash fire

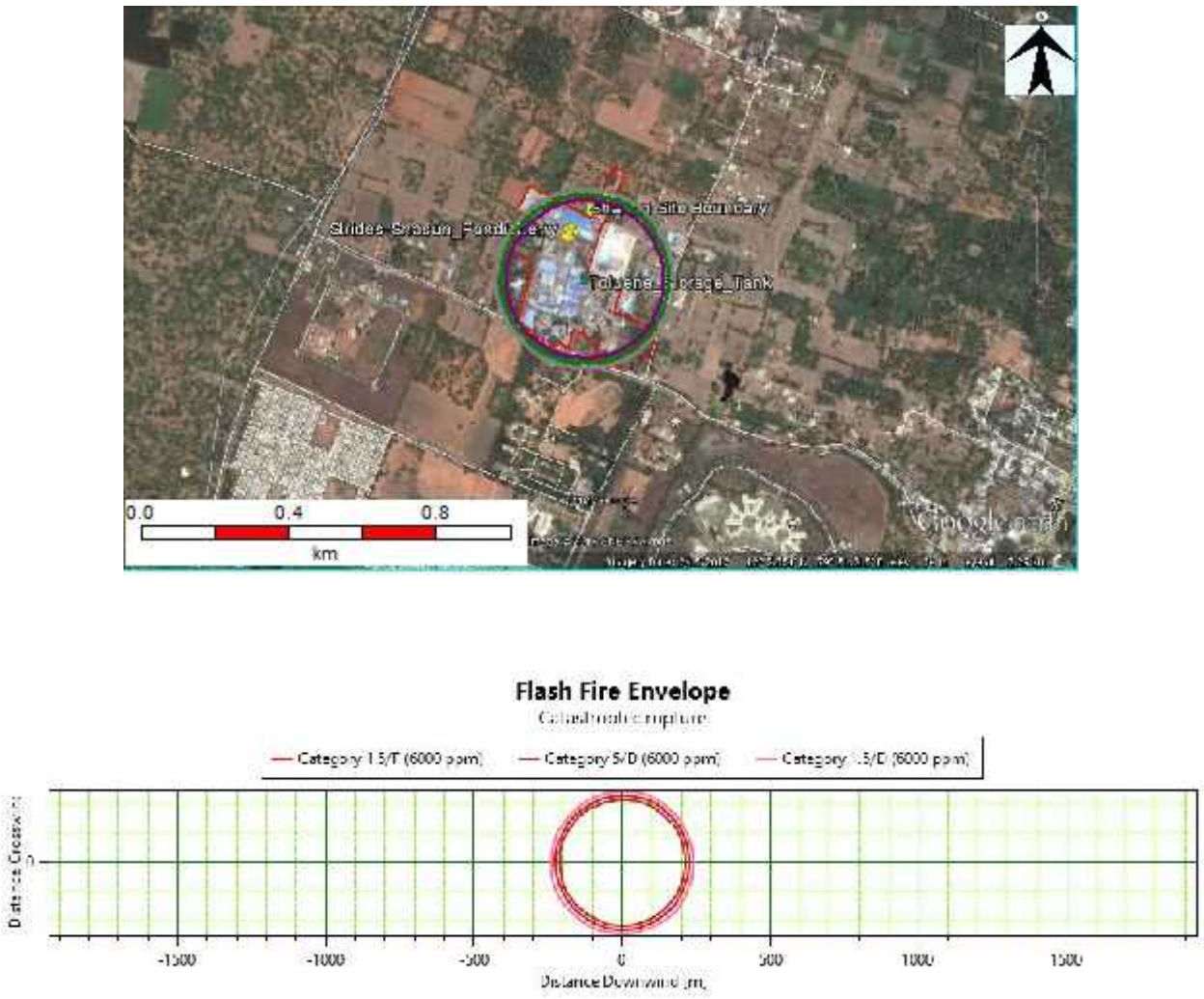


Figure 3-22 Flash Fire from Catastrophic rupture of Toluene Storage tank

Case-3 Explosion

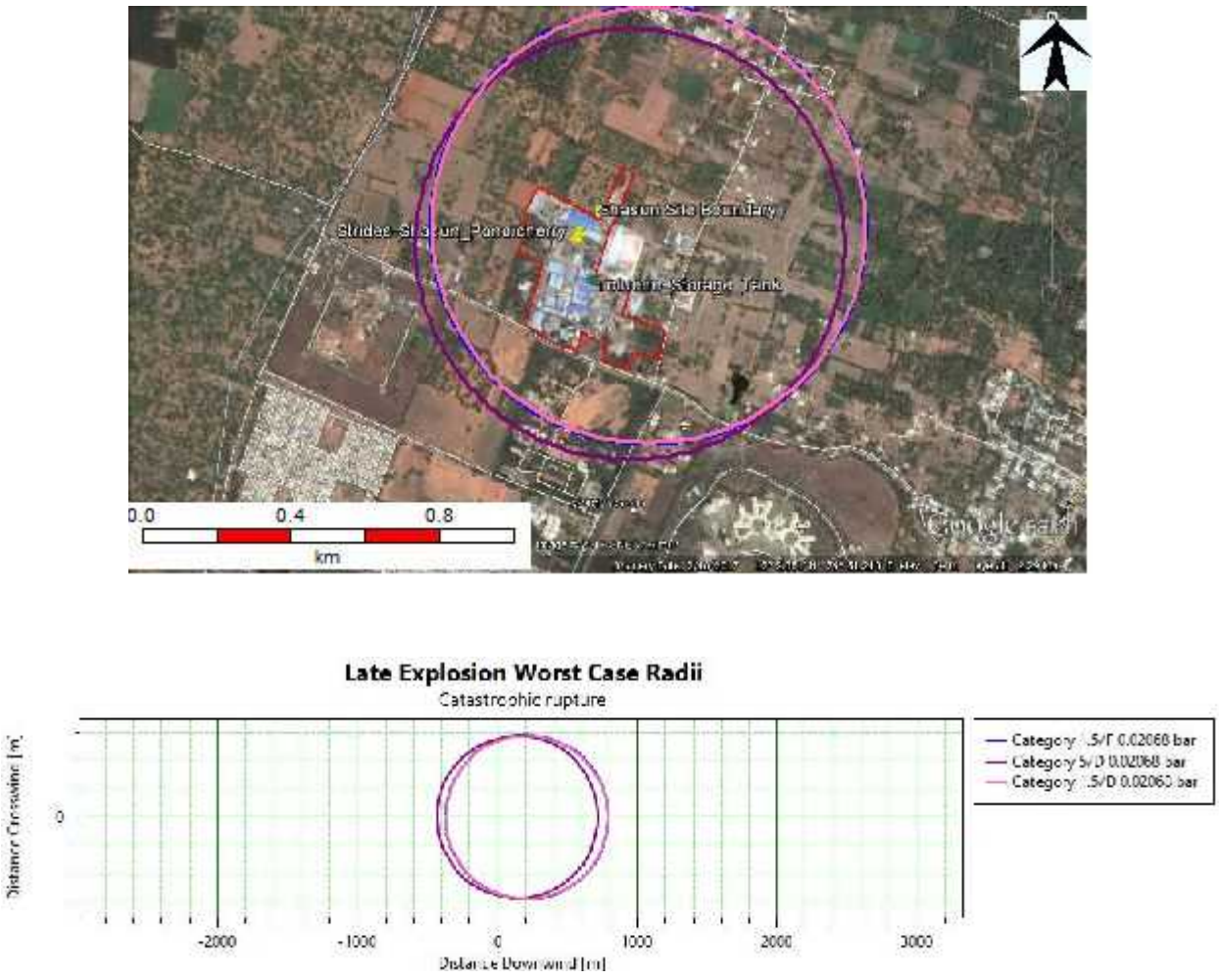


Figure 3-23 Explosion from Catastrophic rupture of Toluene Storage tank

CONTOUR MAPS

Scenario - 4: Catastrophic rupture of Acetone Storage tank

Case- 1 Dispersion of Vapor cloud

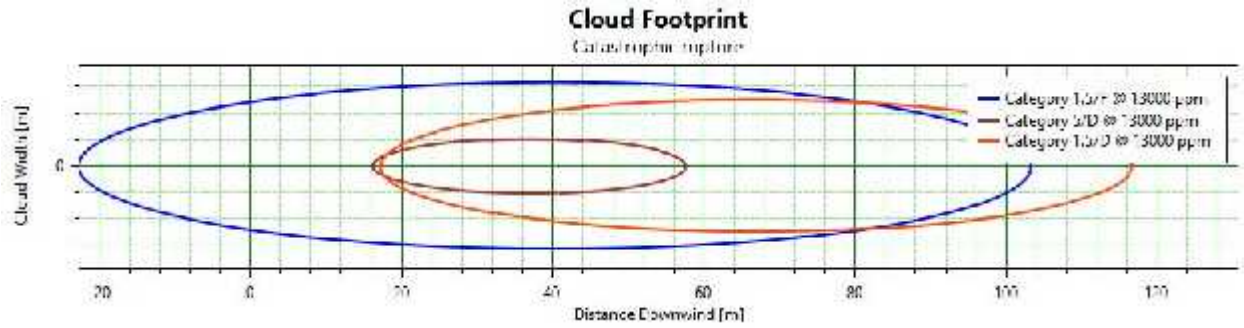


Figure 3-24 Dispersion of vapor cloud from Catastrophic rupture of Acetone Storage tank

Case- 2 Flash fire

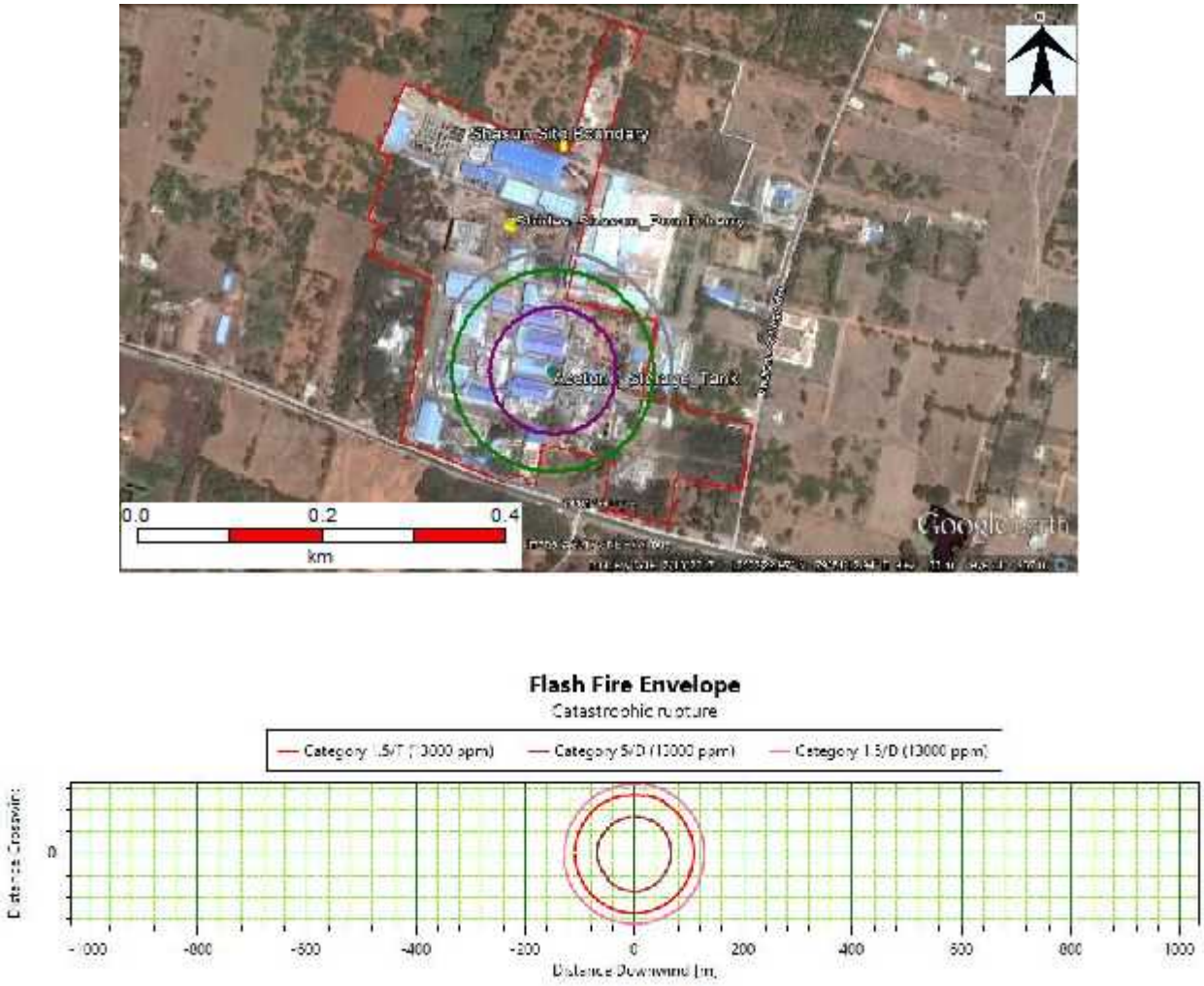


Figure 3-25 Flash Fire from Catastrophic rupture of Acetone Storage tank

Case-3 Explosion

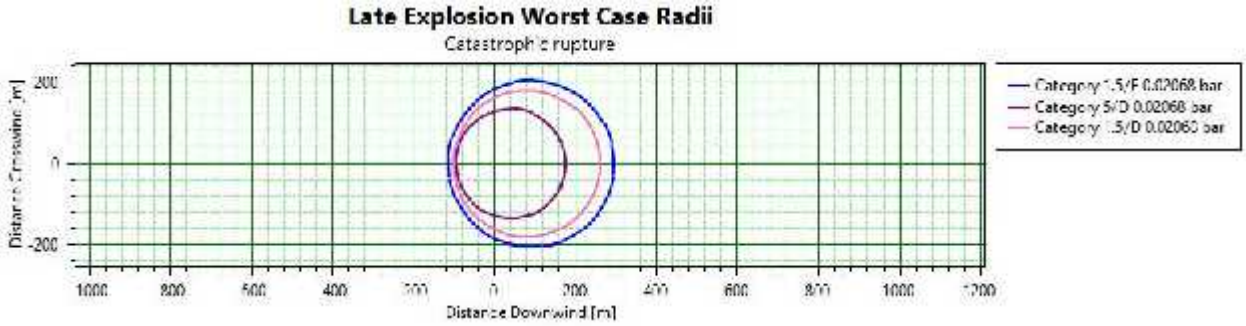


Figure 3-26 Explosion from Catastrophic rupture of Acetone Storage tank

CONTOUR MAPS

Scenario - 5: Catastrophic rupture of Hexane Storage tank

Case- 1 Dispersion of Vapor cloud

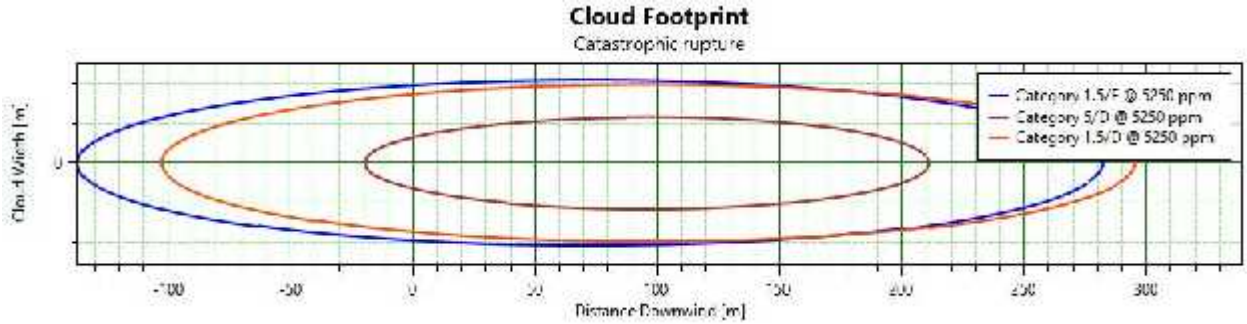
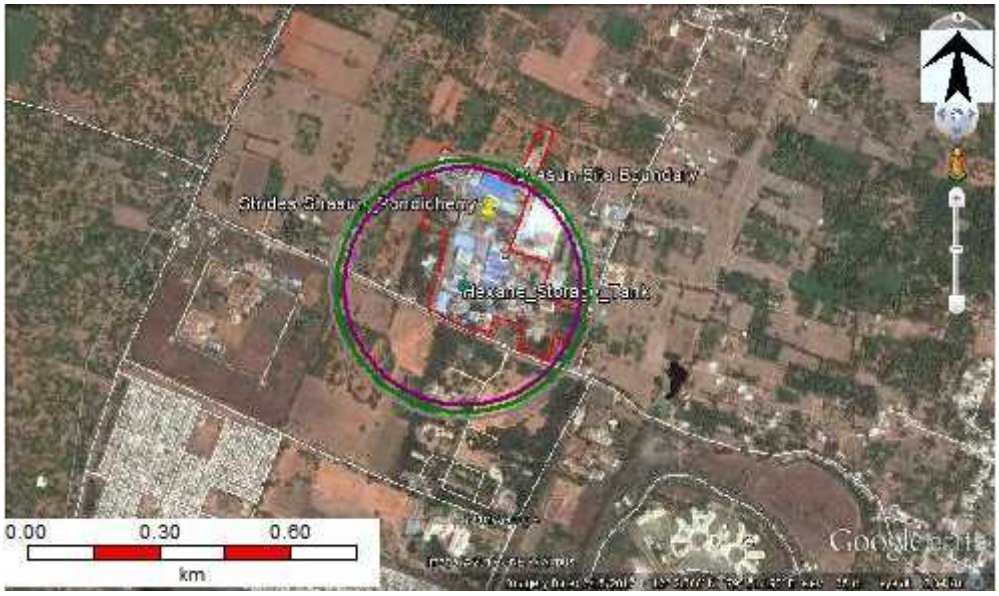


Figure 3-27 Dispersion of vapor cloud from Catastrophic rupture of Hexane Storage tank

Case- 2 Flash fire



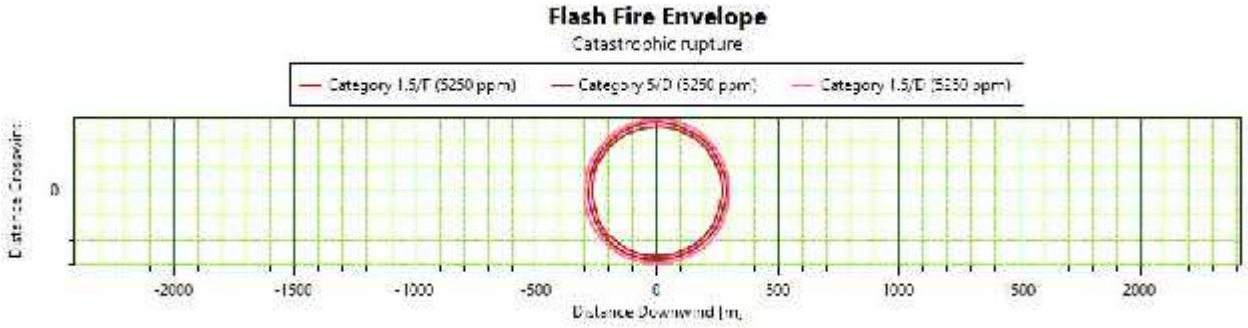


Figure 3-28 Flash Fire from Catastrophic rupture of Hexane Storage tank

Case-3 Explosion

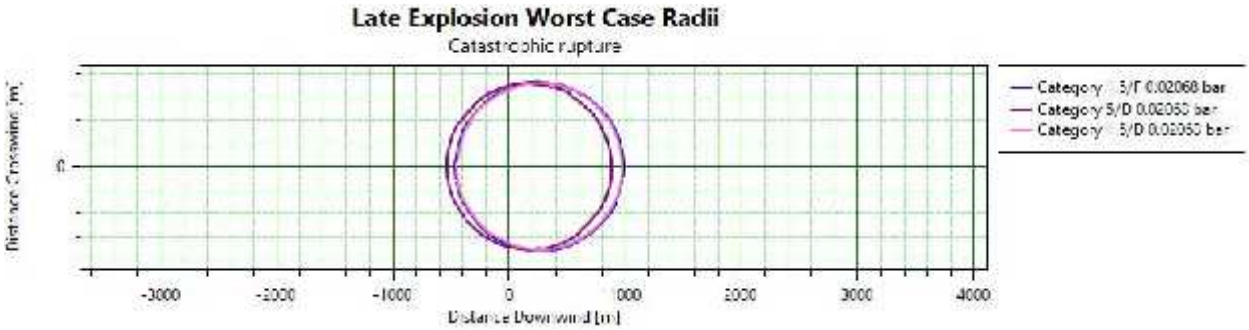


Figure 3-29 Explosion from Catastrophic rupture of Hexane Storage tank

Table 3-6: Estimated distance due to rupture of pipelines

S.No	Description	Event	Impact criteria	Consequence Distance (m)		
				Category 1.5/F	Category 5/D	Category1.5/D
1	Rupture of Hexane Storage tank pipeline	Vapor cloud	UFL (76800)	6.217	0.758	4.688
			LFL (10500)	16.91	8.42	18.53
			LFL Frac (5250)	23.85	16.88	26.61
		Jet Fire	4 kW/m^2	13.69	11.53	13.87
			12.5 kW/m^2	11.32	9.19	11.48
			37.5 kW/m^2	10.25	7.93	10.36
		Pool fire	4 kW/m^2	12.56	14.44	12.67
			12.5 kW/m^2	7.51	10.17	7.62
			37.5 kW/m^2	2.83	4.57	2.94
		Flash Fire	5250 ppm	23.85	16.888	26.61
			10500 ppm	16.91	8.42	18.53
		Explosion	0.02068 bar	90.56	29.53	58.33
			0.1379 bar	33.71	13.79	29.39
			0.2068 bar	30.28	12.84	27.04
2	Rupture of Iso Propanol Storage tank pipeline	Vapor cloud	UFL (120000)	1.37	0.78	0.64
			LFL (20000)	7.19	1.17	7.92
			LFL Frac (10000)	10.47	4.5	12.18
		Jet Fire	4 kW/m2	3.59	3.27	3.696
			12.5 kW/m^2	Not Reached	Not Reached	Not Reached
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Pool fire	4 kW/m^2	12.97	14.58	13.02
			12.5 kW/m^2	7.66	10.16	7.71
			37.5 kW/m^2	3.53	4.29	3.58
		Flash Fire	10000 ppm	10.47	4.50	12.18
			20000 ppm	7.19	1.17	7.92
		Explosion	0.02068 bar	42.64	--	35.59
			0.1379 bar	16.34	--	14.97
			0.2068 bar	14.75	--	13.73

3	Rupture of Acetone Storage tank pipeline	Vapor cloud	UFL (120000)	5.617	0.708	5.354
			LFL (26000)	13.69	5.831	14.41
			LFL Frac (13000)	19.65	13.02	21.57
		Jet Fire	4 kW/m2	7.90	6.64	8.10
			12.5 kW/m^2	7.51	5.28	7.64
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Pool fire	4 kW/m^2	11.68	13.46	11.75
			12.5 kW/m^2	6.56	9.27	6.63
			37.5 kW/m^2	2.94	3.73	3.01
		Flash Fire	13000 ppm	19.65	13.02	21.57
			26000 ppm	19.69	5.83	14.41
		Explosion	0.02068 bar	53.63	28.94	71.75
			0.1379 bar	18.48	13.68	30.05
			0.2068 bar	16.35	12.761	27.54
4	Rupture of Methanol Storage tank pipeline	Vapor cloud	UFL (360000)	0.61	0.37	0.40
			LFL (73000)	5.5	1.13	5.66
			LFL Frac (36500)	11.34	2.63	9.76
		Jet Fire	4 kW/m2	Not Reached	3.94	Not Reached
			12.5 kW/m^2	Not Reached	Not Reached	Not Reached
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Pool fire	4 kW/m^2	9.60	11.13	9.68
			12.5 kW/m^2	4.77	6.57	4.84
			37.5 kW/m^2	Not Reached	Not Reached	Not Reached
		Flash Fire	36500 ppm	11.35	2.63	9.76
			73000 ppm	5.51	1.13	5.66
		Explosion	0.02068 bar	32.00	--	--
			0.1379 bar	14.27	--	--
			0.2068 bar	13.21	--	--

5	Rupture of Toluene Storage tank pipeline	Vapor cloud	UFL (71000)	4.59	0.77	3.03
			LFL (12000)	13.33	4.86	14.69
			LFL Frac (6000)	19.05	12.45	21.86
		Jet Fire	4 kW/m2	13.741	11.49	13.91
			12.5 kW/m^2	11.44	9.23	11.59
			37.5 kW/m^2	10.54	8.14	10.65
		Pool fire	4 kW/m^2	13.44	15.24	13.54
			12.5 kW/m^2	8.17	10.65	8.27
			37.5 kW/m^2	3.21	5.03	3.33
		Flash Fire	10000 ppm	19.05	12.45	21.86
			20000 ppm	13.33	4.86	14.69
		Explosion	0.02068 bar	51.32	27.47	72.50
			0.1379 bar	18.03	13.39	30.20
			0.2068 bar	16.02	12.54	27.65

Scenario-1 Rupture of Methanol Storage tank Pipeline

Case-1 Dispersion of Vapor cloud

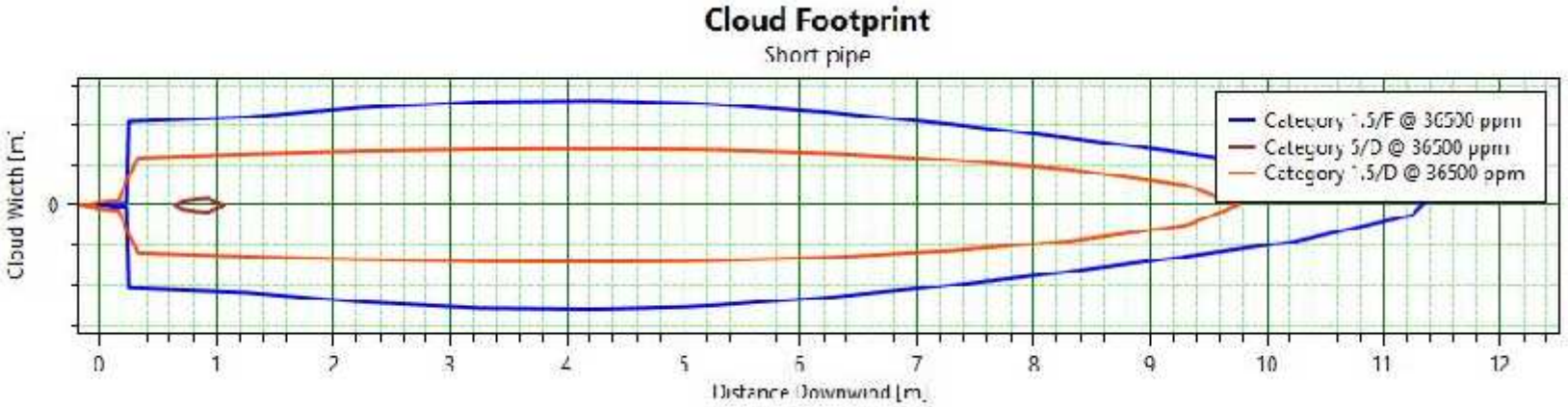


Figure 3-30 Dispersion of vapor cloud from rupture of Methanol Storage tank Pipeline

Case-2 Jet fire

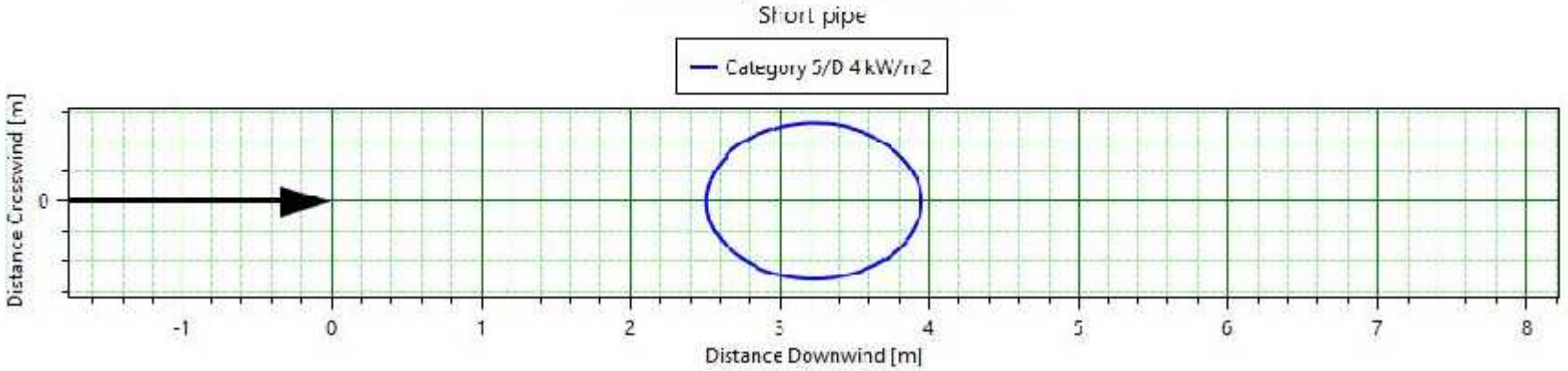


Figure 3-31 Jet fire from rupture of Methanol Storage tank Pipeline

Case-3 Pool fire

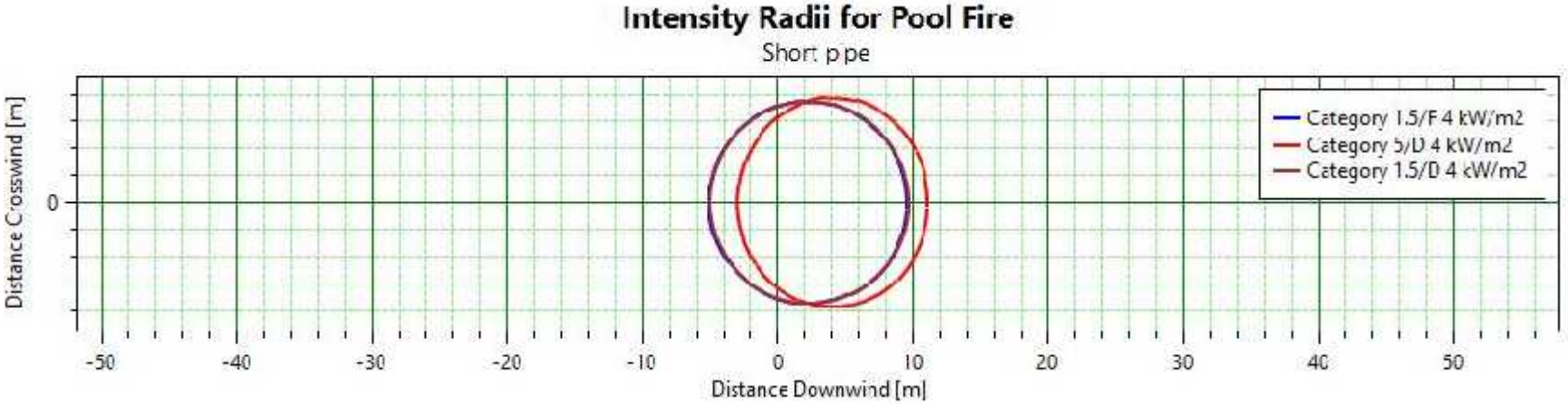


Figure 3-32 Pool fire from rupture of Methanol Storage tank Pipeline

Case- 4 Flash fire

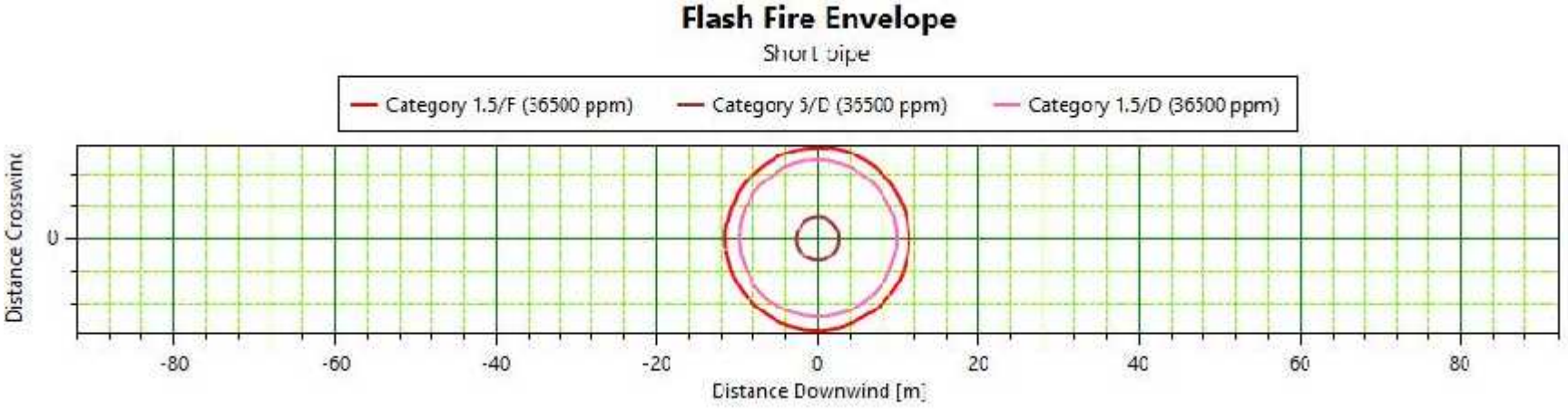


Figure 3-33 Flash fire from rupture of Methanol Storage tank Pipeline

Case- 5 Explosion

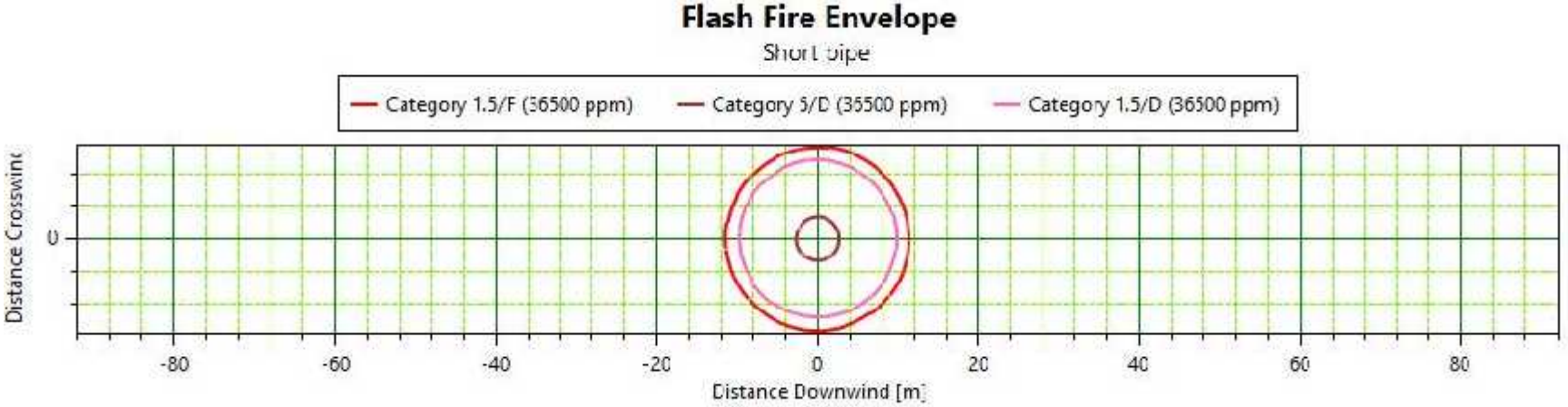


Figure 3-34 Explosion from rupture of Methanol Storage tank Pipeline

Scenario-2 Rupture of Iso Propanol Storage tank Pipeline
Case-1 Dispersion of Vapor cloud

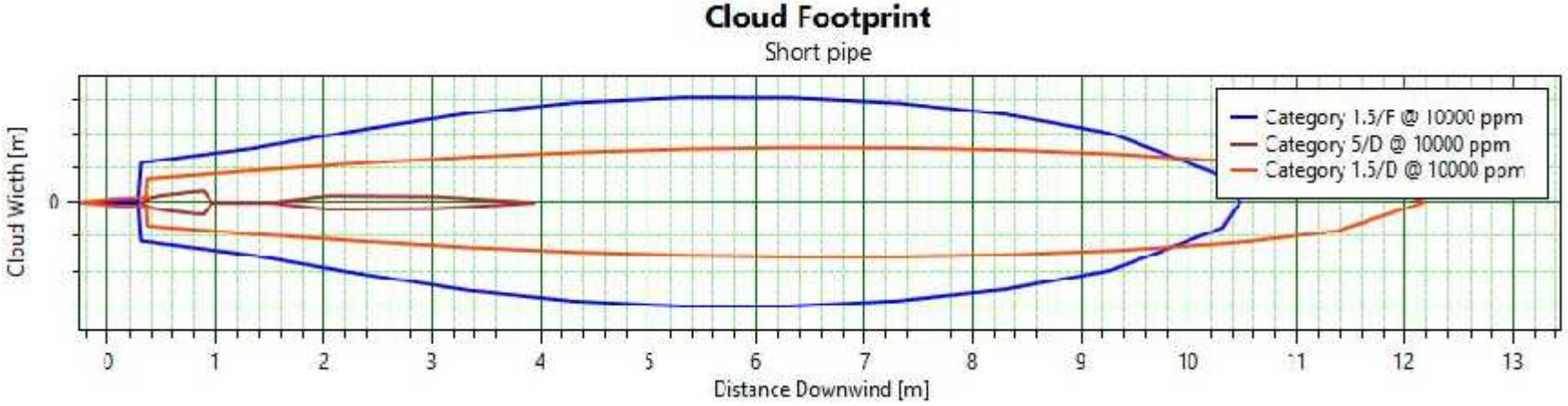


Figure 3-35 Dispersion of vapor cloud from rupture of Iso Propanol Storage tank Pipeline

Case-2 Jet fire

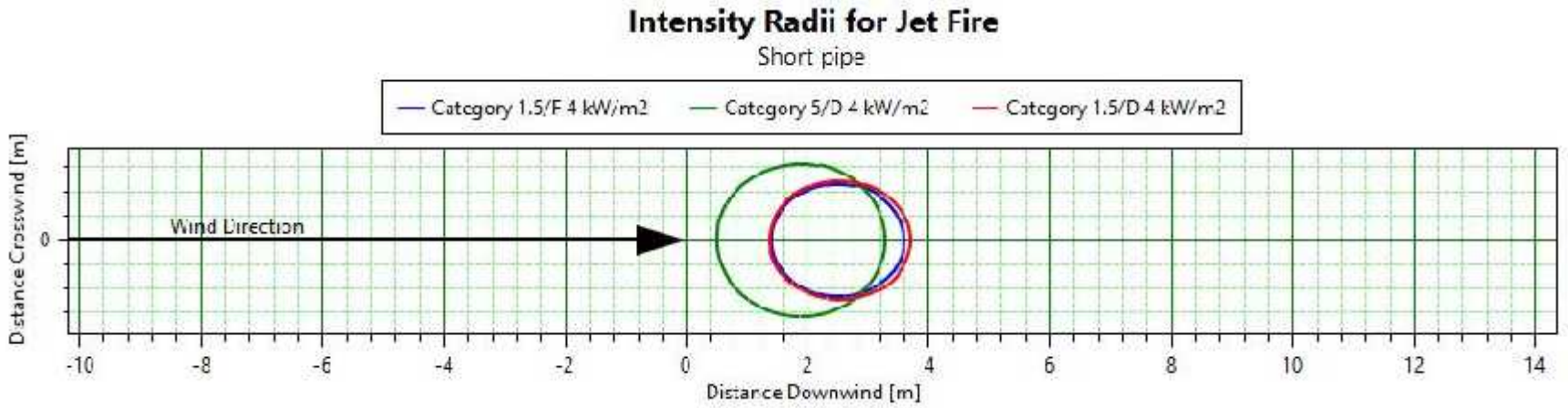


Figure 3-36 Jet fire from rupture of Iso Propanol Storage tank Pipeline

Case-3 Pool fire

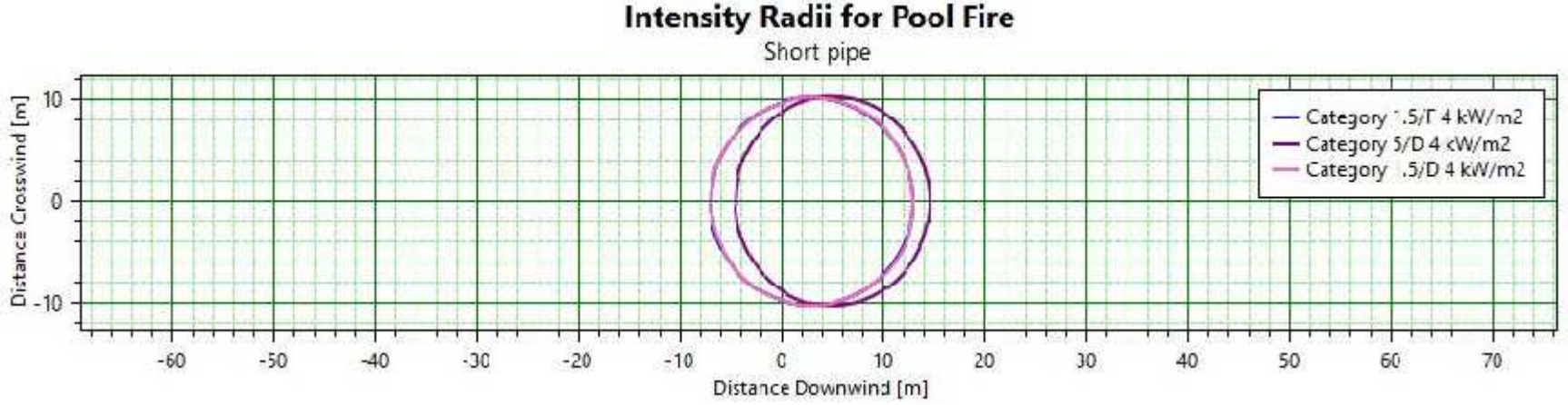


Figure 3-37 Pool fire from rupture of Iso Propanol Storage tank Pipeline

Case- 4 Flash fire

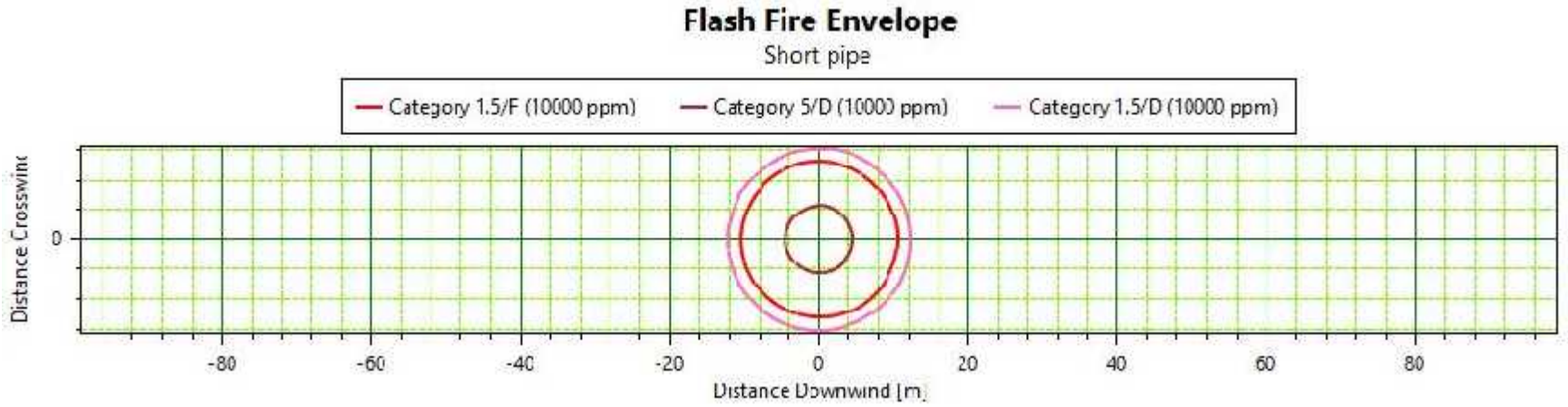


Figure 3-38 Flash fire from rupture of Iso Propanol Storage tank Pipeline

Case- 5 Explosion

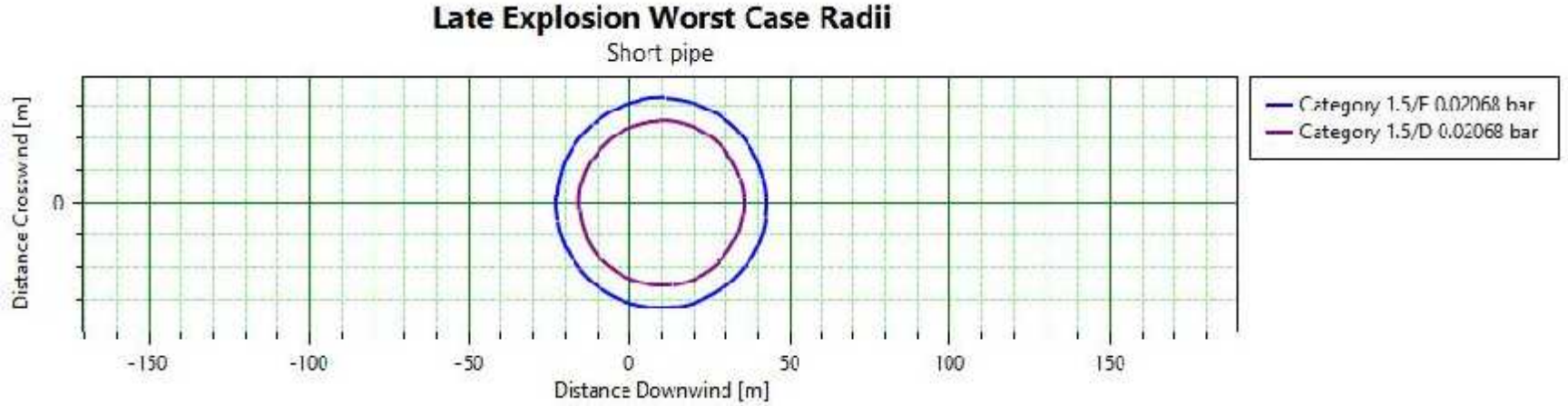


Figure 3-39 Explosion from rupture of Iso Propanol Storage tank Pipeline

Scenario-3 Rupture of Toluene Storage tank Pipeline
Case-1 Dispersion of Vapor cloud

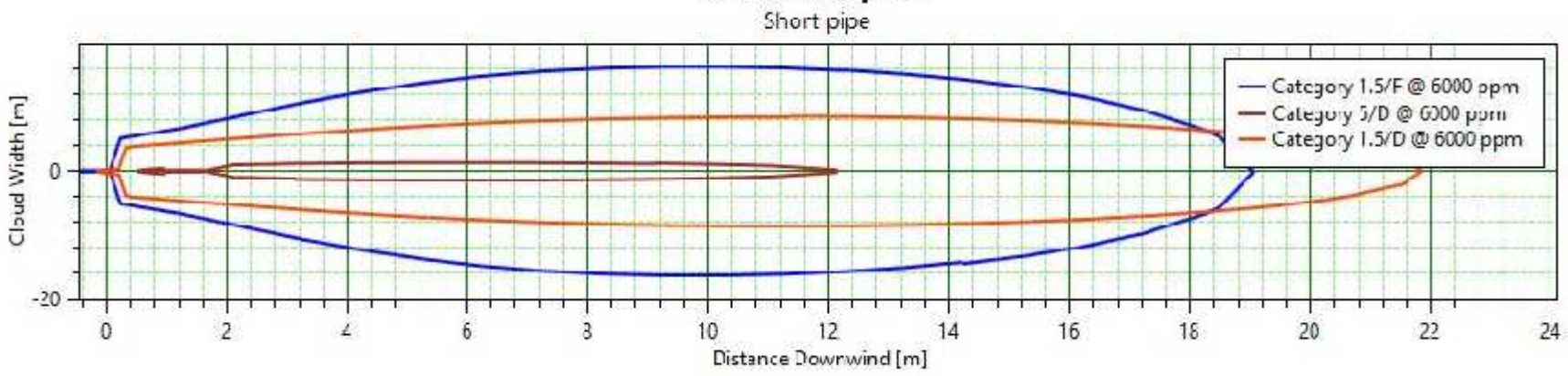


Figure 3-40 Dispersion of vapor cloud from rupture of Toluene Storage tank Pipeline

Case-2 Jet fire

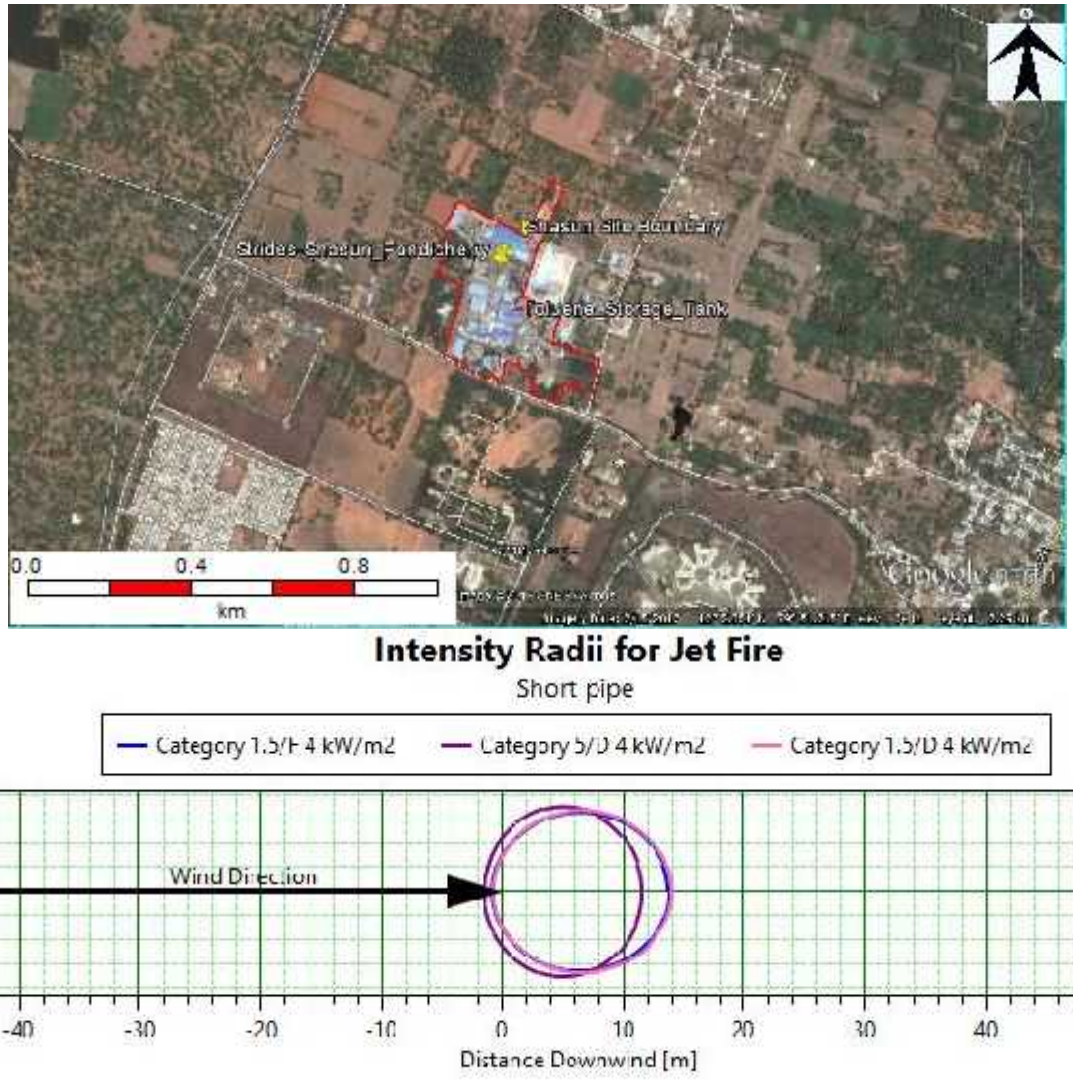


Figure 3-41 Jet fire from rupture of Toluene Storage tank Pipeline

Case-3 Pool fire

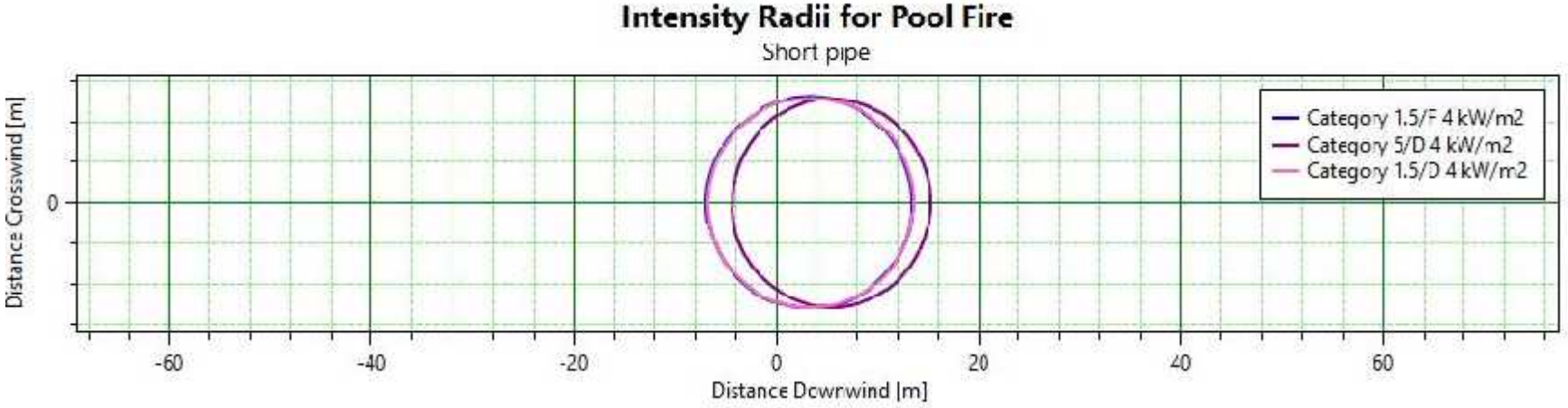


Figure 3-42 Pool fire from rupture of Toluene Storage tank Pipeline

Case- 4 Flash fire

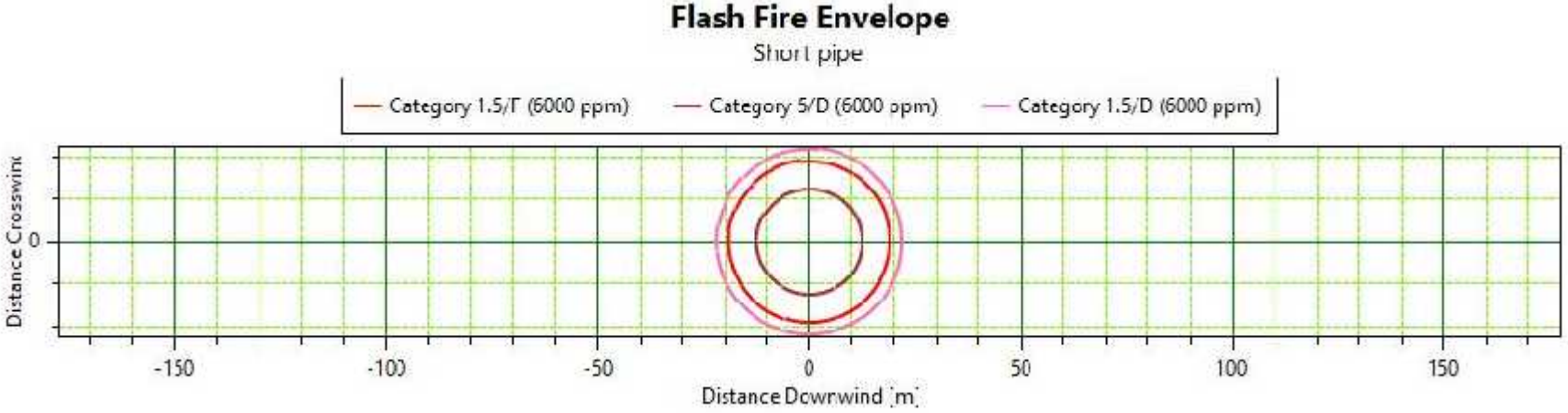


Figure 3-43 Flash fire from rupture of Toluene Storage tank Pipeline

Case- 5 Explosion

Figure 3-44 Explosion from rupture of Toluene Storage tank Pipeline

Scenario-4 Rupture of Acetone Storage tank Pipeline
Case-1 Dispersion of Vapor cloud

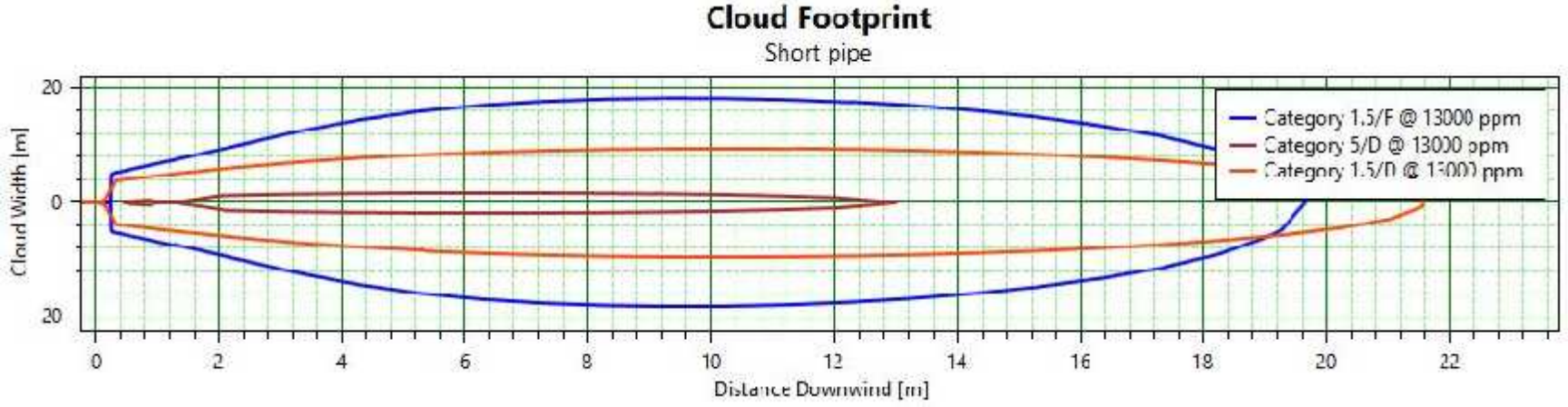


Figure 3-45 Dispersion of vapor cloud from rupture of Acetone Storage tank Pipeline

Case-2 Jet fire

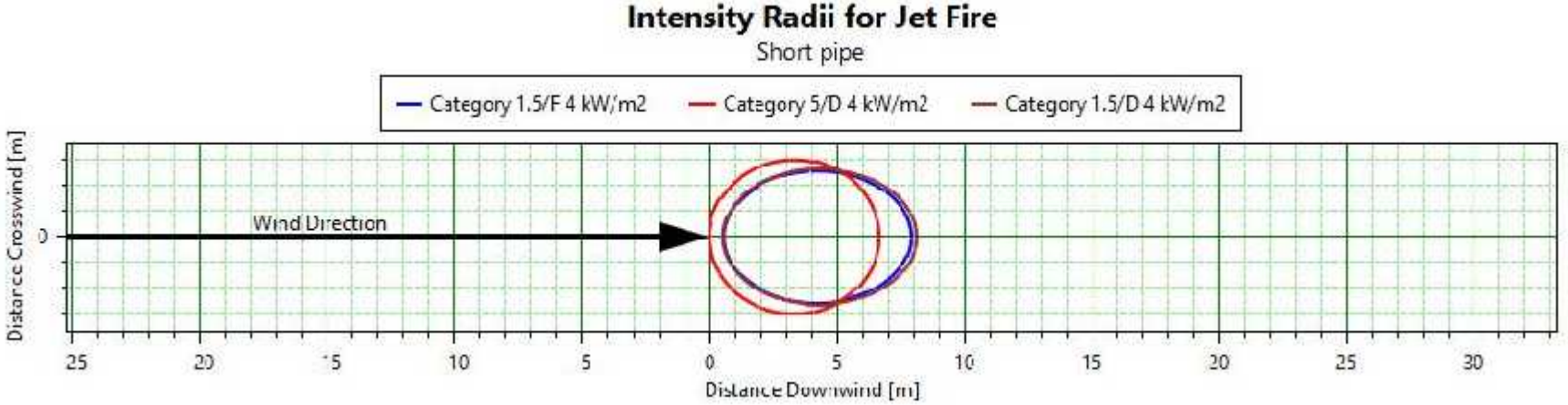


Figure 3-46 Jet fire from rupture of Acetone Storage tank Pipeline

Case-3 Pool fire

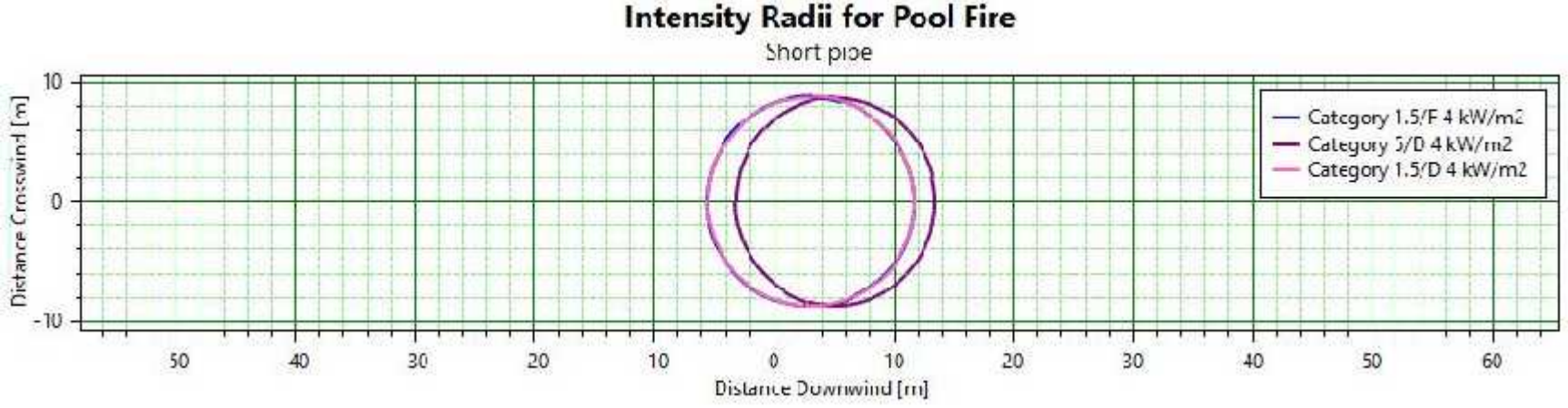


Figure 3-47 Pool fire from rupture of Acetone Storage tank Pipeline

Case- 4 Flash fire

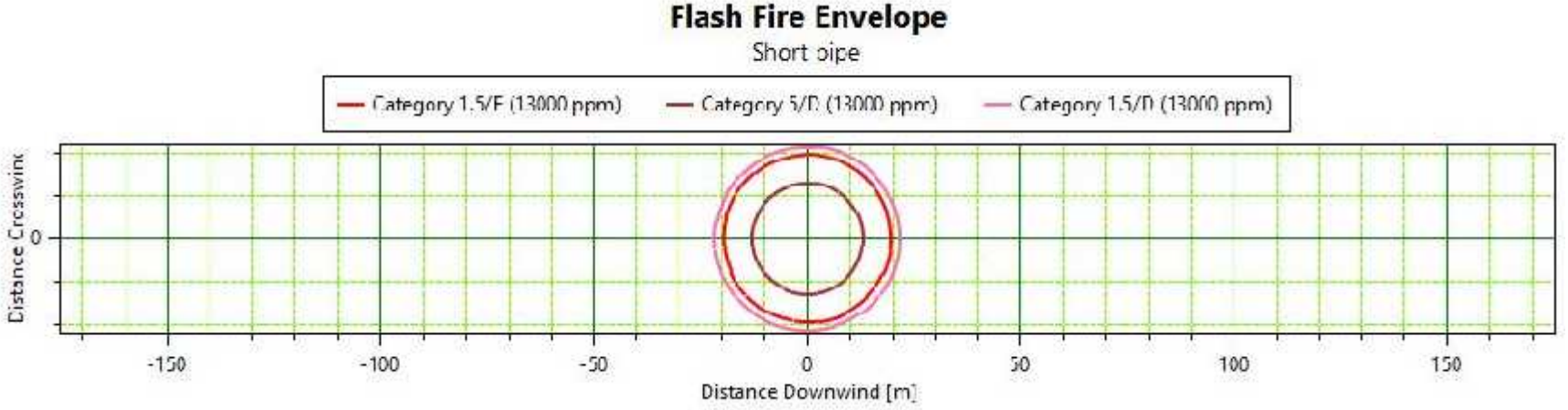


Figure 3-48 Flash fire from rupture of Acetone Storage tank Pipeline

Case- 5 Explosion

Figure 3-49 Explosion from rupture of Acetone Storage tank Pipeline

Scenario-2 Rupture of Hexane Storage tank Pipeline

Case-1 Dispersion of Vapor cloud

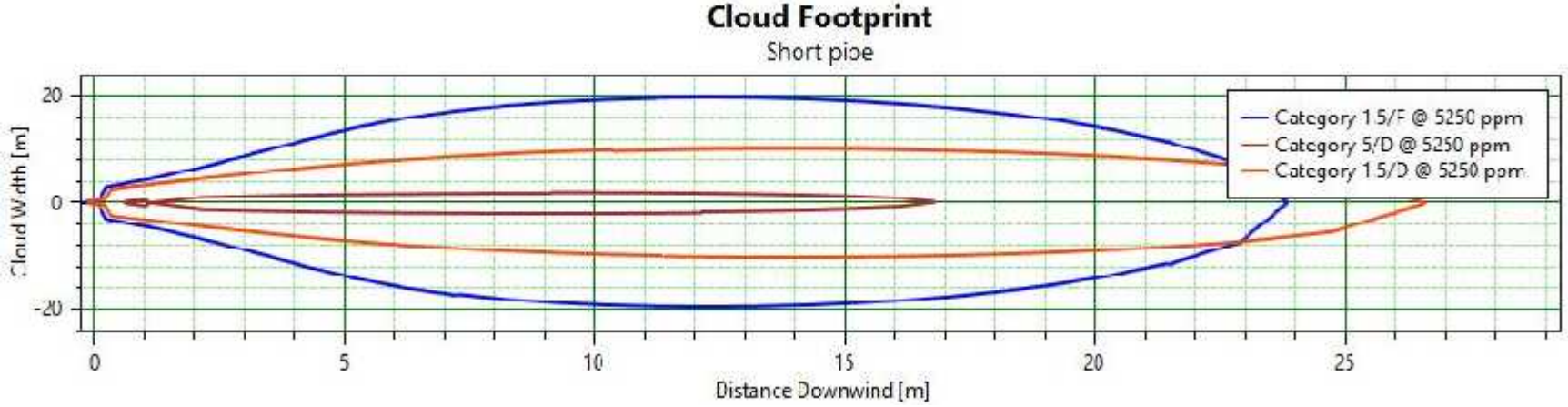


Figure 3-50 Dispersion of vapor cloud from rupture of Hexane Storage tank Pipeline

Case-2 Jet fire

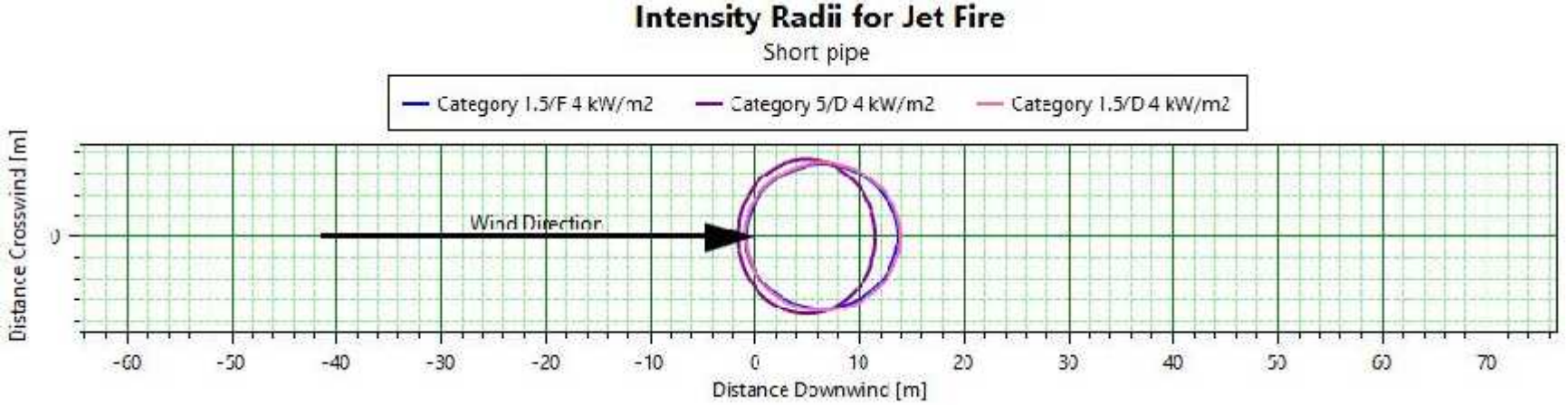


Figure 3-51 Jet fire from rupture of Hexane Storage tank Pipeline

Case-3 Pool fire

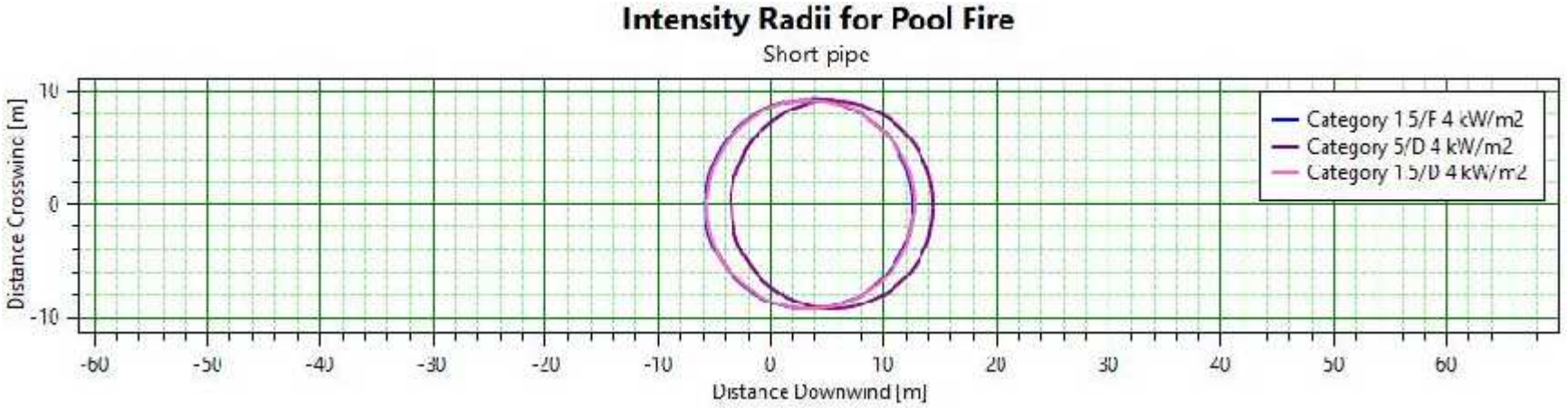
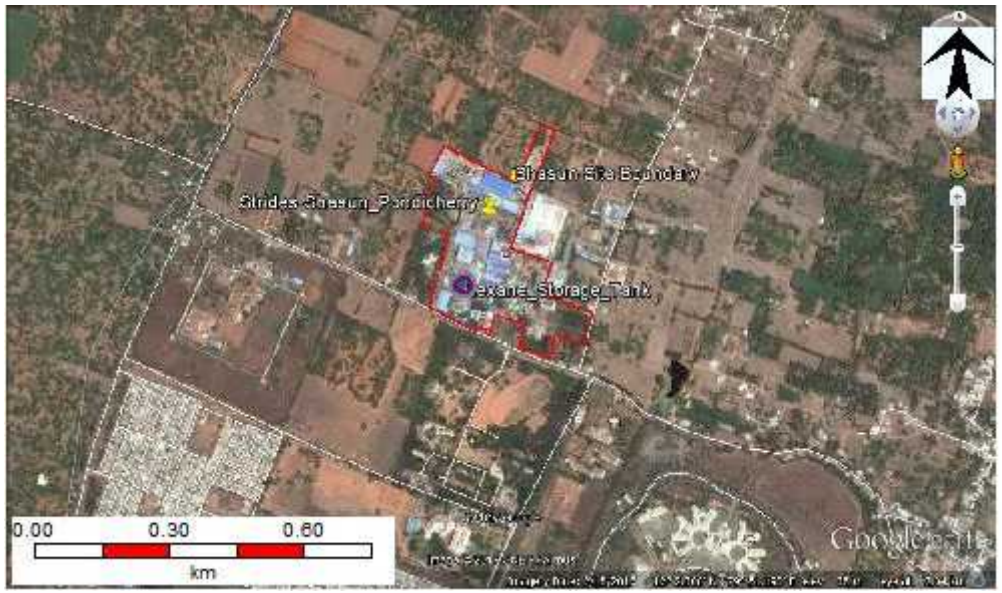


Figure 3-52 Pool fire from rupture of Hexane Storage tank Pipeline

Case- 4 Flash fire



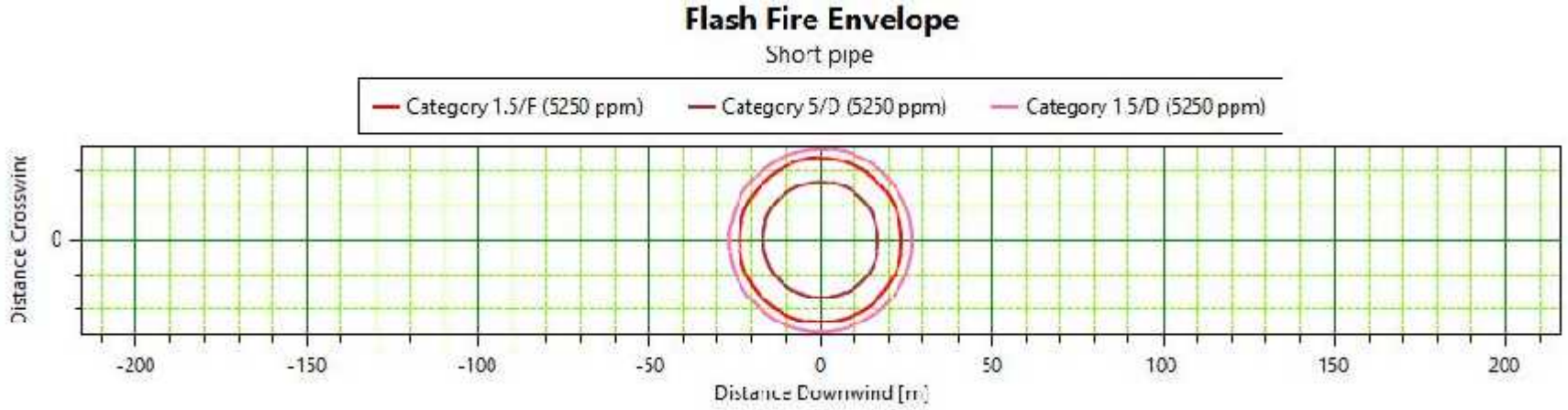


Figure 3-53 Flash fire from rupture of Hexane Storage tank Pipeline

Case- 5 Explosion

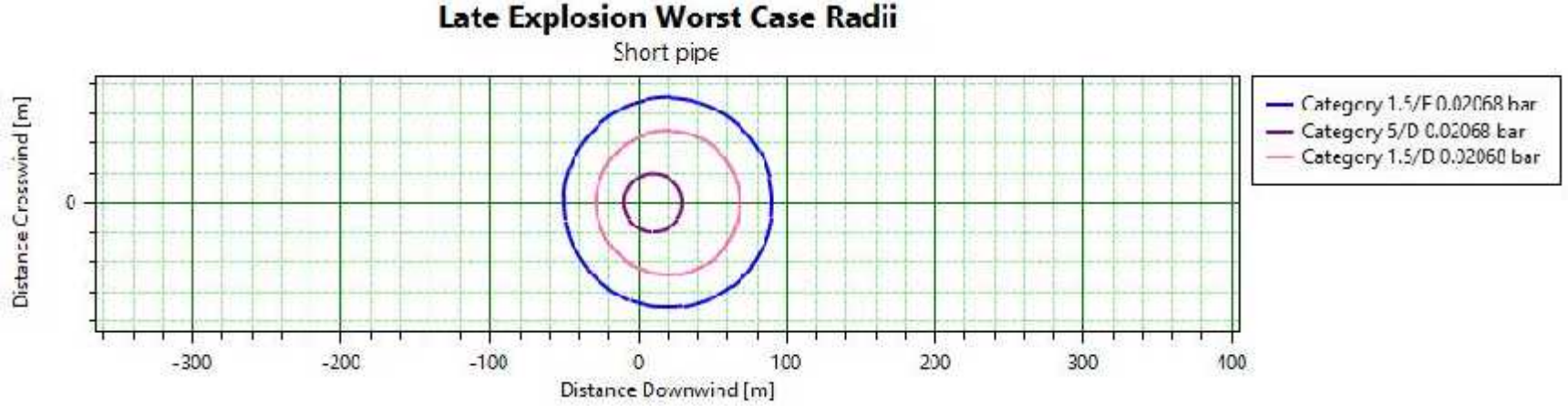


Figure 3-54 Explosion from rupture of Hexane Storage tank Pipeline

3.4 Summary of results and observations

- As per the NFPA rating, the fire hazard is observed in chemicals such as Acetone, Toluene, Hexane, Iso-propanol and Methanol. All the chemical are stored underground tank where the impacts are negligible and even risk contours maps are not generated.
- Risk assessment is done for day storages tanks and pipelines with max. capacity and length only.
- The Consequence analysis study has been carried out for Acetone, Toluene, Hexane, Iso-propanol and Methanol storage tank and pipelines.
- All the hazards are observed in North-East direction due to the wind, which is blowing from South-West direction.
- It is observed for IPA, Methanol, Toulene, Acetone, Hexane storage tanks in the catastrophic rupture scenario, the estimated distance for Explosion are 793.71m, 110.21m, 793.71m, 292.62m and 981.246m at wind speed of 1.5 m/s and stability class F, at the pressure of 0.02068 bar.
- It is observed for Hexane, IPA, , Methanol storage tank pipeline in the rupture scenario, the estimated distance for Explosion are 90.56m, 42.64m, 32m at wind speed of 1.5 m/s and stability class F, at the pressure of 0.02068 bar. Acetone Toluene storage tank pipeline in the rupture scenario the estimated distance for explosion are 71.75m, and 72.5m at wind speed of 1.5 m/s and stability class D, at the pressure of 0.02068 bar
- Mitigative measures for storage tanks are proposed to avoid hazards.

4 MITIGATIVE MEASURES

4.1 Summary of risk analysis and findings

1. All statutory appurtenances requirement with reference to safety and fire protection have been incorporated in the design.
2. Necessary preventive and protective measures are proposed for storage tanks and handling.

4.2 Recommendations for improving safety

The following measures are considered for enhancing the safety standards at site:-

1. Operator training and retraining should be a continuous effort and Mock Drills should be carried out regularly on identified scenarios.
2. Work Permit System should be strictly enforced and should not be allowed to be circumvented.
3. Hoses should be inspected and tested every six monthly for the recommended test pressure.
4. Static protection and integrity of explosion proof equipment should be ensured through regular inspection. Every electrical equipment and lighting features should meet explosion proof requirement, in classified area.
5. Smoking and carrying smoking material are to be strictly prohibited.
6. Interlock to be provided in the storage tank.
7. Earth link may be connected to pump circuit to ensure startup only after providing tank earth - connection.
8. Safety Procedures and Do's and Don'ts should be prepared and displayed in handling and storage area.
9. Conveyor sides should have plastic guide strips in preference to metallic strips to prevent friction and consequent hazards.
10. Periodic inspection of Pipelines and painting to be done to avoid corrosion and subsequent leak.
11. The Plant commissioning has an important role to ensure long term safety. Proper cleaning and flushing of the system should be ensured in storage area and fire hydrant system to avoid possible hold up of welding slag's, bolts, nuts etc. which could hamper smooth operation.
12. All the solvents are being distributed across the production plants through closed pipe lines and transfer pumps that will minimize fugitive loses.

13. The Environment team are trained on industrial hygiene and sampling / testing techniques.
14. The local exhaust ventilation is provided at storage locations which are connected to the scrubbers.

5 DISASTER MANAGEMENT PLAN

5.1 Objectives

a. To establish a method of systematic, safe and orderly evacuation in the least possible time, to a safe area or by the nearest safe means of way out.
b. Control the accidents.
c. Rapid control and containment of hazardous situation.
d. Rescue and treatment of casualties.
e. Safeguard people (both at site and neighbourhood).
f. Minimize damage to property and environment.
g. Identify casualties, notify their relatives and render necessary help to them.
h. Proper training of the concerned person.
i. Prevent recurrence.
j. Be capable of dealing with largest incident that can reasonably be foreseen.
k. Have sufficient flexibility with a view to handling the emergency efficiently and avoiding unnecessary calling outside agencies like external fire brigade.

5.2 Basic forms of Emergency

a. Fire
b. Explosion
c. Toxic release
d. Natural disaster (earth quake, flooding, tsunami etc.)
e. A combination of more than one

5.3 Types of Emergency

5.3.1 On-site Emergency

If an accident/ incident takes place in a factory, its effects are confined to the factory premises, involving only the persons working in the factory and the property inside the factory it is called as On-site Emergency.

It can be again classified as minor and major emergency based on severity of the incident.

Minor Emergency (Evacuation is not required)

In the case of minor emergency there will be no evacuation siren and the respective department personnel will handle the same with assistance of Safety Squad.

Major Emergency (Evacuation is required)

In case of major emergency there will be emergency siren and situation is tackled as per the plan.

5.3.2 Off-site Emergency

If the accident is such that it affects inside the factory are uncontrollable and it may spread outside the factory premises, it is called as Off-site Emergency.

Assessment reveals that an Off-site emergency is a very remote possibility in our factory. If there is a situation, first we shall avail the service of local police to warn and advice the local public about things to do to save them from the effect of emergency situation.

Moreover, the factory is located in industrial area. Hence, there are no residential houses in factory surrounding area.

5.4 Causes of Emergency

The emergency may caused by factors like failure of system, human error, sabotage and natural calamities like earth quake, flooding etc.

Irrespective of cause, the emergency will generally manifest itself in one of the three basic forms i.e. fire, explosion and release of toxic substance.

5.5 Safety, Health & Environment Policy

1. Assurance of Safety, Protection of Health & Environment is prime function and responsibility of the Management and the Management will inculcate the safety behavior down the line through exemplary behavior.
2. All the employees are periodically trained & informed about the hazards to which they are exposed & Safety measures to be taken including personal protective equipment.
3. To provide the resources required for Safety, Health and Environment protection.
4. We affirm to reduce the wastages, recycle the resources and disposal of wastages will be as per statutory norms.
5. All our facilities will be operated & maintained by the prescribed Standard Operating Procedures covering routine & non-routine activities.

6. All the accidents / near-miss accidents will be investigated thoroughly for their root cause to avoid recurrence. Corrective and preventive actions applicable for the same will be enforced.
7. Health, Safety & Environmental performance is constantly measured through periodic audits of facility for continuous improvements.

5.6 Mitigation Measures Required

a. Fire Hydrant System
b. Fire Extinguisher
c. Emergency Equipments / PPEs
d. Eye Wash Fountain and Safety Shower
e. Work Zone Monitoring Equipments
f. Wind Sack / Wind Direction Indicator
g. Occupational Health Centre
h. First Aid Boxes

5.7 Emergency Shutting Down Procedure

1. Critical operations will be shut down by the respective technician / operator upon getting the necessary instruction from the shift in charge. An emergency shutdown can be done after getting approval from Incident Controller / Site Controller.
2. Utility Controls will be shut off by maintenance personnel who will know the location and operation of main controls for gas, solvent and electrical supply leading into the building.
3. An emergency shutdown of computers should be accomplished in the event of a severe electrical storm. If time permits, exit the program and shut off the computer power supply.

5.8 Control Room

Control Room also termed as Emergency Control Centre (ECC) is a place from which all the decisions with regard to actions for control of emergency, rescue and medical treatment are made. Security office is considered as emergency control centre. It contains the following facilities.

a. Communication equipment
b. Copies of emergency management plan
c. Emergency escape route map

d. List of emergency contact numbers
e. Emergency light
f. Location of emergency supplies like PPEs / emergency equipments, layout of fire fighting system, assembly point etc.
g. Emergency organization team details

5.9 Alert Action Plan during Working &Non Working Hours

5.9.1 Alert Action Plan during Working Hours

It can be divided as follows

a. Detection
b. Decision
c. Annunciation
d. Reaction
e. Recovery and Return to normal activities

a) Detection

The detection of any mishap like fire, explosion or toxic release is identified by either sensors or by any person working in the plant to activate alarm system.

b) Decision

The Department Head / Shift in-charge (Incident Controller) has to assess the size and nature of emergency and to decide whether it is a minor or major emergency and then to inform Site Controller immediately.

c) Annunciation

Site Controller will get complete information of the incident, assess the incident and if require pass an order to security to wail Emergency Siren through which every Department will come to know about the emergency, then accordingly they will plan to evacuate from their respective Departments.

Emergency Siren pattern,

This alarm will blow in the high pitch and low pitch level with interval of 15 sec between two blows. The mechanism will be in the form of waves of high and low frequency for 3 minutes.

d) Reaction

After hearing the emergency siren, all should stop their activities in a safe manner.

Except Emergency Organization Team members, all should come to safe assemble area and stay there for head count and for further instruction of Site Controller.

Emergency Organization Team members should act as per their pre-determined responsibility to;

i. To localize the emergency and if possible to eliminate it
ii. Minimize the effects of accident on people and property

e) Recovery and return to normal activities

Once Emergency is mitigated, normalcy is restored; head count is matched, then Site Controller will pass an order to Security to wail All Clear Signal.

All Clear Signal Siren pattern. It is a continuous alarm for one minute.

After hearing the All Clear Signal, all can move to their respective work places to start their normal activities.

5.9.2 Alert Action Plan during Non-Working Hours

During non working hours, i.e., in holidays, there will be no production activities. As we are carrying only batch processes, all the equipments (both process and utility) will be shut down and no chemical storage inside the production areas during holidays and also ensure the cleaning and good housekeeping.

All the 365 days Fire Hydrant System and Fire alarm systems are kept in active mode, to monitor this technical person and security persons will present round the clock throughout the year to tackle the worst case scenario in case of emergency.

5.10 On Site Emergency Planning

A. Constitution of Teams

a. Fire Fighters / Rescuers
b. First Aiders
c. Maintenance Team

a. Fire Fighters / Rescuers

- The fire fighters / rescuers shall attempt to extinguish or control the fire / prevent further toxic leakage without taking personal risk before the arrival of the fire brigade / other external agency.

- The fire fighters / rescuers shall also attempt to save the lives of people who are unable to ensure their own survival without assistance.

b. First Aiders

- The First Aiders shall get ready the first aid equipment, proceed to designated area and set up First Aid Point in coordination with Site Controller.

c. Maintenance Team

The Maintenance Team shall;

- The maintenance team shall go to important controlling areas like Fire Hydrant Pump House, DG area etc.

B. Define Roles And Responsibilities In Brief

In the event of emergency, nominated individuals / teams are given specific responsibilities; separate from their day to day activities.

The Emergency Organization Team consist,

a. Site Controller (SC)
b. Incident Controller (IC)
c. Emergency Co-ordinator – HR & Admin
    i. Hospital, Law & Order
    ii. Head Count
d. Emergency Co-ordinator Maintenance
e. Emergency Co-ordinator Safety Squad
    i. Fire Fighters / Rescuer
    ii. First Aider

C.1. Roles and responsibilities of Emergency Organization Team members

a. Site Controller (SC)

Site Controller is a person who has ultimate control over the affairs of the company during emergencies inside the plant. His responsibilities include;

- He should go to the Emergency Control Centre as soon as he is aware of the emergency and take over the situation.
- Get complete information of the incident.
- Assess the incident and if require pass an order to security to wail Emergency Siren.

- Remain in ECC and establish the contact with Incident Controller and guide him about the actions to be taken.
- Arrange for additional help as requested by Incident Controller with the help of Emergency Coordinators.
- If required call outside services like fire brigade, medical facility, water tankers, police etc with the help of Emergency Coordinators.
- Guide and control the traffic movements in evacuation.
- Establish communication and liaise with agencies like Department of Factories and Boilers, Pollution Control Board, Police and other Government Officials.
- Inform Incident Controller about missed people if any, after head count has been done.
- To issue authorized statements to the news media.
- Once situation is controlled, head count matched then instructs security to wail 'All Clear Signal'.
- Rehabilitation of affected areas after the emergency.

b. Incident Controller (IC)

Incident Controller is a person who is responsible for incident control measures, rescue operations and mitigation of emergency situation on Coordination with Site Controller. His responsibilities include;

- Proceed to the incident spot as information is received.
- Assess the size and nature of emergency and communicate the same to Site Controller and keep in touch with Site Controller till the emergency is mitigated / controlled.
- Start and direct all emergency control operations with the help of Emergency Coordinator - Safety Squads.
- Request Site Controller for additional help like Safety Squads from other Departments, fire brigades etc.
- Direct shut down of the processes / plants and also nearby plants.
- Ensure evacuation of all personnel in coordination with Site Controller.
- Once emergency is mitigated, normalcy is observed, instruct Site Controller for the same.

c. Emergency Co-ordinator – HR & Admin

HR & Admin team consist two persons, one person will be stationed at the Emergency Control Centre during the emergency to handle hospital, fire, police and

other inquiries under instruction of Site Controller and other person will carry out headcount at assembly point and pass on the absentee information to the Site Controller.

i. Emergency Co-ordinator Hospital, Law & Order

His responsibilities shall include -

- Proceed to the Emergency Control Centre and report to Site Controller.
- Ensure the gates are closed.
- With the help of security, control crowd at gate as per instruction from Site Controller.
- Deploy one guard at main gate with instructions not to allow / send any personnel, vehicles inside except fire tender and ambulance.
- Keep ready the list of important telephone numbers and contact numbers of police and other law and other agencies.
- Inform other statutory departments, corporate office as per instruction from Site Controller.
- Inform relatives / contact persons of the injured accordingly.
- Get hold of medical management procedure / list, hospital / telephone numbers, accordingly.
- Call the respective medical institute as per the instruction from Site Controller.
- Prepare a sequential report of the incident.

ii. Emergency Co-ordinator Head Count

His responsibilities shall include -

- Proceed to the Emergency Control Centre and report to Site Controller
- Ensure carrying Master Attendance Copy.
- Proceed to assembly point and collect attendance sheet from respective department.
- Compare the list and look for missing personnel if any.
- Inform Site Controller about the same.

d. Emergency Co-ordinator Maintenance

Emergency Co-ordinator Maintenance will take care of emergency control systems like Fire Hydrant System, DG units etc and also mobilize the tool and other emergency equipments as per the instruction of Site Controller.

- One of the co-ordinator will move to Fire Hydrant pump house and switch on /off the pump as per the instruction of Site Controller.
- One of the co-ordinator will move to Generator room and switch on / off as per the instruction of Site Controller.
- One of the co-ordinator will be available on phone and act as per the instruction of Site Controller.

e. Emergency Co-ordinator Safety Squad

Emergency Co-ordinator Safety Squads will fight the emergency to mitigate it and to protect life, property.

i. Emergency Co-ordinator Fire Fighters / Rescuer

- Proceed to the incident spot along with emergency equipments and report to Incident Controller.
- Set up emergency equipment.
- Act as per the instruction of Incident Controller.
- Make quick assessment of the injured and arrange to shift with the help of Incident Controller to safer place for first aid.
- Send one co-ordinator of the team along with injured.
- Search for missed ones and do rescue operation for the needy.

ii. Emergency Co-ordinator First aider

- Proceed to Emergency Control Centre along with team and report to Site Controller.
- Set up emergency equipments.
- Be ready to receive and to provide first aid to victim and to help the ambulance staff.
- Make quick assessment of the injured and arrange to send victim to hospital with the coordination of Site Controller.
- Send one co-ordinator of the team to hospital along with injured with medical management procedures.

C.2. Roles and responsibilities of persons other than Emergency Organization Team members

- Do not venture out for help.
- Be available in the Department till evacuation is called.

- After hearing the Emergency siren, all should stop their work in a safe manner immediately.
- All work permits will be cancelled automatically.
- All should come to Safe Assembly Area (In front of Safety Office).
- While coming to Safe Assemble Area,
  - Do not run, walk brisk.
  - Do not use lift, use only staircase.
  - Do not block staircase, use hand rail. Come in a line.
  - Do not obstruct / block the path to Emergency Organization Team members.
- Do not go back for your belongings.
- Do not use telephone except for emergency purpose.
- Follow instructions of Site Controller in Safe Assemble Area.
- After All Clear Signal, all can go back to their respective places / Departments.

C. Notification of Emergency

The notification of any mishap like fire, explosion or toxic release is identified by either sensors or by any person working in the plant. If detection by sensors, alarm system will get activated or if it by a person, he will activate alarm system. As soon as Incident Controller aware of the emergency, he will rush to incident spot and assess the size and nature of emergency and communicate the same to Site Controller.

D. Declaration of Emergency

Site Controller will be the person to decide whether the situation warrants evacuation of the premises or is a localized incident. This individual will be termed as the declarer of emergency. Immediately the declarer will make arrangements to give information to the Executive Director.

Once an emergency requiring evacuation has been decided upon by the declarer, the Emergency will be declared by putting on the Emergency Siren.

E. Evacuation of Personnel

All Safety Squad co-ordinators from the Department where the incident has occurred and from other Department will reach earliest to the point of incident. All other people working in the factory will assemble at designated assembly point i.e., in front of Safety Department after hearing the Emergency Siren.

The Emergency co-ordinators will assist in directing the individuals to the assembly point.

F. Accounting of Personnel

The Emergency Co-ordinator HR & Admin, Head Count Person will conduct head count as per particular days attendance record at the assembly point to account for persons working inside the factory and also for visitors / vendors present inside the premises. Information on missing persons will immediately convey to Site Controller.

G. Controlling of Emergency

The Safety Squad member from the affected area and Safety Squad members from other Departments will attempt to control / mitigate the emergency situation under the supervision of Incident Controller and instruction of Site Controller.

H. Arrangements for Medical Treatment

Any person injured in the incident and subsequently, will be treated by Emergency coordinator, First Aider.

First Aid team member will accompany the injured to hospital. In the event of additional medical help, the injured will be shift to recommended Hospital.

I. Information to the Relatives of the Injured

The relatives of injured will be informed by Emergency Coordinator HR & Admin for Hospital, Law & Order. The communications to the relatives of injured will be through telecom or by a messenger. The clear address of availability of the injured person (if hospitalized) will be communicated to his relatives.

J. Information to the Government Authorities

The Emergency Coordinator HR & Admin for Hospital, Law and Order is the person to inform and get help from Fire Station, Police and other Government Hospitals in coordinating with Site Controller.

K. Law & Order

Site Controller will take over and control emergency in coordination with Incident Controller and other Emergency Coordinators.

The Executive Director will arrange to send information regarding the incident to the Director of Factories, Government of Pondicherry.

L. All Clear Signal

Once Emergency is mitigated, normalcy is restored; head count is matched, then Site Controller will pass an order to Security to wail All Clear Signal.

After hearing the All Clear Signal, all can move to their respective work places to start their normal activities.

5.11 Offsite Emergency Plan

5.11.1 Preamble

An offsite emergency arising out of chemical hazards in one, which has potential to cause serious damage or loss of life beyond the plant boundary. In addition, Accidents during transportation of hazardous chemicals by road, rail, pipeline etc. can cause offsite emergencies. Emergency services such as Police, Fire, Medical etc., need to be prepared to handle such situations promptly and effectively.

It is mandatory under Rule 16 of the Hazardous Chemical Rules for District authorities to prepare an off-site emergency plan in respect of clusters of hazardous chemical industries or at locations where accidents are likely to have an off-site adverse effect.

In order to be in a state of preparedness to respond to the accidents and minimize their adverse impacts on the offsite population, requires an offsite emergency plan to be prepared by the District Controller for every District or Industrial Areas as applicable.

5.11.2 Objective

The objective of the present assignment is to prepare an area specific Offsite Emergency Action Plan for Pondicherry which can be practically implemented / activated at a short notice to ensure minimal impact on life and property due to emergencies arising out of Chemical Accidents or during Transportation of Hazardous Chemicals in the district.

The plan should be regularly updated when there are changes occurring in the Industrial set up, Transportation Aspects, Key Manpower and Administrative Changes etc., Regular drills, Training of key persons, increasing safety awareness etc is extremely important areas that must be looked into for sound preparedness.

5.11.3 Offsite Emergency Control

After the “Bhopal Gas Tragedy” (Methyl Isocyanides- MIC Poisonous and toxic gas release Accident at Union Carbide, 1984) the Government felt an immediate need to be more conscious about handling of Hazardous Chemicals. Central control room Centre or Offsite Industrial Emergency Control Room “OIECR” should be established by company. It should work under the Governing Council. The Governing Council should be headed under the chairmanship by District Collector & Magistrate.

The Governing Council Members are the permanent Ex. Officio Members to manage the affairs of the Emergency Control Room.

5.11.4 Emergency Instruction to the General Public

The Notification of Emergency

The emergency can be declared by following media to alert or alarm the public;

1. Public address system
2. Blow horns/Bells
3. Sirens / Hooters
4. Telephone message / Fax Messages / Hot lines/ Pager / E-mail / Mobile Phone / Satellite system
5. Sending messages through a messenger
6. Rushing personally to the Central Control Room or to the nearest Police Department or Fire Department for declaration of emergency.
7. Raising of Flag for denoting the level of natural calamities
8. Ham Radio
9. By any other source by which information can reach to the public in time.

5.11.5 Category of Alarm Systems

The following alarm system may be considered which will identify the various level of emergency.

5.11.5.1 First Level Warning (Fire Alarm)

- For an accident / incident within the unit
- Hooter / Siren – Short, intermittent

5.11.5.2 Second Level Warning

- When the District Authority receives information that a toxic or flammable gas has leaked then the siren has to be sounded in order to facilitate early evacuations from the unit.
- Siren – A wailing short and long intermittent siren notification of emergency.

5.11.5.3 Third Level Warning (All Clear)

- When the District Authority considers that the accident / incident is under control, emergency is withdrawing and it is safe for re-entry.
- Siren – A wailing, long and continues, intermittent siren.

5.11.6 Fire Fighting System

In order to tackle great risk of fire explosion, spillage of hazardous liquid or release of toxic gases, fire fighting system should be mobilized under chief fire officer. The operational response will be coordinated from the Central Control Room.

5.11.7 General Instruction to the Public

A major emergency may affect areas outside the works. The surrounding public will be alerted with public address system by Police or Government Authorities or nearby industrial concerns. The siren / hooter will blow to indicate arising the emergency situation.

It will be indicated which kind of emergency arised, Start the Radio / TV for further instruction & act accordingly. So that public will take prompt action to protect them-selves or rush to the safe shelter as instructed by the authority.

First of all to ascertain which type of emergency arised.

1. Fire
2. Explosion
3. Gas Leakage / Release
4. Collapse of Building, Brusting of Vessel etc.
5. Natural Calamities.

If gas leakage emergency arised, ascertain probability of gas whether flammable, toxic or poisonous. The following actions are suggested as per prevailing situation: Otherwise follow the instruction as issued by the authority

5.11.7.1 Flammable Gas :

a. Be calm, don't get panicky
b. Do not light Cigarette etc
c. Shut down open flame, gas and electrical instruments or any source of ignition
d. Do not move any vehicle in the area
e. Do not go near the incident & don't allow any others
f. Shut down the windows, doors etc. & seat open ground or terrace.
g. Follow the instruction as directed by the authority

5.11.7.2 Toxic Poisonous Gas

a. Cover your nose with wet hand kerchief / cloth and breath through it.

b. Come out in open, check the wind direction and move away quickly in perpendicular direction of wind. (cross wind direction)
c. Immediately go & try to get to a higher elevation, if gas is heavier than air (like chlorine, as it settles in low lying area)

Follow the instruction and reach safe shelter as instructed notified by Government Authority or Public authority.

5.11.7.3 General Instruction :

(A) DON'T

1. Do not get panicky, be calm
2. Do not approach the site of incident as a spectator
3. Do not approach unnecessarily for information or more enquires
4. Do not allow unnecessarily crowd nearby incident place
5. Do not believe in rumors unnecessarily

(B) DO'S

1. Listen radio, TV or Public Addressing System.
2. Emergency will be communicated by public addressing system / TV / Radio or siren (Siren-code wailing sound for one minute)
3. Follow the instruction & convey to others accordingly
4. On announcement of withdrawal of emergency or clearance Siren, start your routine work
5. On enquiry, deposit your statement as required by authority at the time of investigating the incident
6. Co-operate, help and assist the person(s) / authority handling the emergency and rescue operation.

5.11.8 Security & Police

Security, protection of life & property and traffic control & maintenance of law and order should be taken care by police. During an emergency duties and responsibilities of the police may be:

a) Cordoning of the incident area
b) Warning public about the hazards
c) Traffic Control
d) Assist fire fighting services
e) Assist first-aid medical teams
f) Assist evacuation and ensure protection of property in evacuated areas.

Different phases of emergency management practices would be as under:

a) Before the Crisis

Proper planning of manpower, transport and communication network to coordinate possible incident areas and regulation of traffic should be made for each industry in the area.

b) During the Crisis

The Security Commander of the area will set in motion the relevant contingency plan to control the operation.

c) After the Crisis

Protect property in the evacuated area.

d) Media

The Control Room should release up-to-date information to the media to the people.

5.12 Summary & Conclusion

Major hazards from the hazardous material storage have been identified and evaluated using PHAST software. This report discussed the impacts due to accidental releases of flammable, explosive and toxic chemicals from the storage tank pipelines. The Consequence analysis is conducted in order to assess the level of impacts associated with storage and handling of hazardous chemicals. The storage tanks are located within Strides Shasun, pondicherry boundary and the surrounding is ideal without external interface. The location is safe for storage and handling of solvents. All other hazards are easily within control limits and away from habitation area.

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Annexure 16 Medical Report

PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014, Ph : 0413-2651111

DEPARTMENT OF BIOCHEMISTRY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	: 46 Y(s)/Male
Bill Date	: 20-Mar-2017 08:41 AM	**UMR No.**	: 2017031430429
Sample Coll.	: 20-Mar-2017 8:52 AM	**Bill No.**	: PR16004155
Sample Rec.	: 20-Mar-2017 10:54 AM	**Result No**	: RES597394
Report Date	: 20-Mar-2017 12:16 PM	**Lab No**	: 170304891
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: Plasma

Parameter	Result Values	Normal Range	
Glucose Random	*213 mg/dl	< 150 mg/dl	HEXOKINASE
Blood Urea	20 mg/dl	15 - 40 mg/dl	UREASE
Creatinine	0.8 mg/dl	Male : 0.7 - 1.4 mg/dl Female : 0.6 - 1.2 mg/dl	JAFF'E'S
LIPID PROFILE			
Total Cholesterol.	188 mg/dl	Desirable : < 200 mg/dl Borderline high : 200 - 239 mg/dl High : > 239 mg/dl	CHOD - POD
Triglycerides	245 mg/dl	Normal : < 150 mg/dl High : 150 - 199 mg/dl Hypertriglyceridemic : 200 - 499 mg/dl Very High : > 499 mg/dl	ENZYMATIC
HDL Cholesterol	31 mg/dl	MALE : 30 - 55 mg/dl FEMALE : 46 - 65 mg/dl	DIRECT-HOMOGENOUS ENZYMATIC
LDL Cholesterol	102 mg/dl	Optimal : < 100 mg/dl Near/above Optimal : 100 - 129 mg/dl Borderline High : 130 - 159 mg/dl High : 160 - 189 mg/dl Very High : > 189 mg/dl	DIRECT
VLDL	*49 mg/dl	15 - 40 mg/dl	CALCULATION
LIVER PROFILE			
BILIRUBIN TOTAL	0.7 mg/dl	Adult : <= 1.2 mg/dl	DIAZO
BILIRUBIN DIRECT	0.2 mg/dl	Adult : <= 0.2 mg/dl	DIAZO
SGOT	24 U/L	Males : <= 40 U/L Females : <= 32 U/L	IFCC
SGPT	26 U/L	Males : <= 41 U/L Females : <= 33 U/L	IFCC

Verified By 4449 **Approved By** 1170 **Dispatched By**

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GANAPATHICHETTIKULAM
PONDICHERRY-605 014.

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry- 605 014.
Telephone : 0413-2656271 /2656272 /2656700 /2656701 Fax : 0413-2656273

20020078

PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014, Ph : 0413-2651111

DEPARTMENT OF BIOCHEMISTRY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	: 46 Y(s)/Male
Bill Date	: 20-Mar-2017 08:41 AM	**UMR No.**	: 2017031430429
Sample Coll.	: 20-Mar-2017 8:53 AM	**Bill No.**	: PR16004155
Sample Rec.	: 20-Mar-2017 10:54 AM	**Result No**	: RES597738
Report Date	: 20-Mar-2017 02:55 PM	**Lab No**	: 0
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: Serum

Parameter	Result Values	Normal Range	
Alkaline Phosphatase	78 U/L	Adult : Males : 40 - 129 U/L Females : 35 - 104 U/L Children : 6 days - 6 month : < 449 U/L 7 months - 1 year : < 462 U/L 1-3 years : < 281 U/L 7-12 years : < 300 U/L	IFCC
Total Protein.	*6.4 g/dl	6.6 - 8.0 g/dl	BIURET
S.Albumin	4.6 g/dl	3.5 - 5.1 g/dl	BCG
GGT	25 U/L	Male : Upto : < 60 U/L Female : Upto : < 40 U/L	IFCC
Uric Acid	4.9	M : 3.5 - 7.2 ; F: 2.6 - 6.0 MG/DL	COLORIMETRIC

*** End Of Report ***

Dr. KALPANA MOHANDAS
ASSISTANT PROFESSOR

Suggested Clinical Correlation * If neccessary, Please discuss

Test results related only to the sample tested.

CLINICAL BIOCHEMISTRY LAB
PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
GANAPATHICHETTIKULAM
PONDICHERRY-605 014.

Verified By 4449 **Approved By** 1170 **Dispatched By**

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2656272 / 2656700 / 2656701 Fax : 0413-2656273

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PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

DEPARTMENT OF PULMONARY MEDICINE
PONDYCHERRY-605 014
Pulmonary Function Test Reports

Iruthayam , V **ID: 1430429** **Age: 46**

Gender	Male	Height	177 cm		COPD
Ethnicity	Asian	Weight	87 kg	BMI 27.8	
Smoker	Yes; 12 Cigarette(s) per Day; Years Smoking 25; (15 Pack Years)				

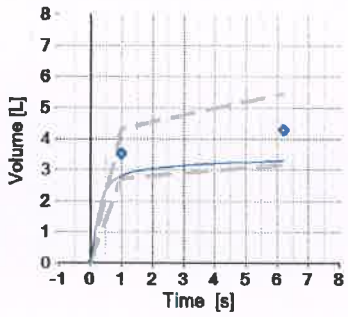
FVL (ex/in)

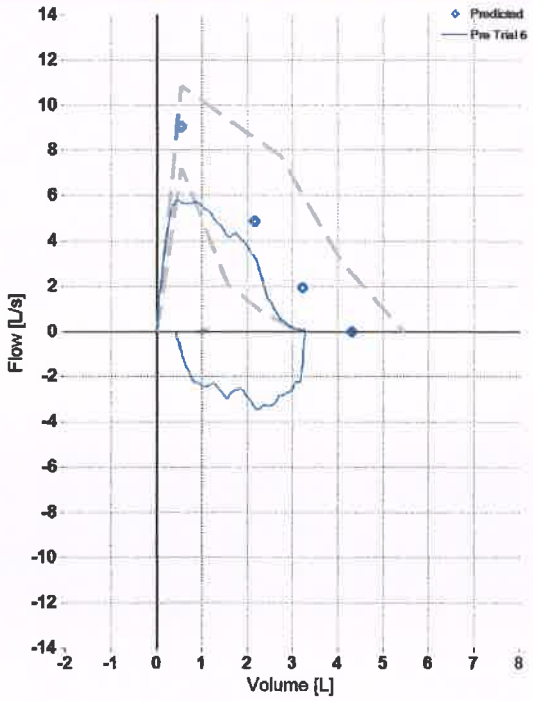
Your FEV1 / Predicted: 80%

Test Date: 20.03.2017 12:54:02 Predicted: Knudson 83 * 0.90

Parameter	Pred	LLN	Pre Best	%Pred
FVC [L]	4.31	3.16	3.29	76
FEV1 [L]	3.52	2.72	2.83	80
FEV1/FVC [%]	81.8	71.1	86.1	105
FEF25-75% [L/s]	4.06	1.64	3.71	91
PEF [L/s]	9.03	-	7.69	85
FET [s]	-	-	6.2	-

Session Quality Pre A (FEV1 Var=0.01L (0.4%); FVC Var=0.06L (1.9%))
System Interpretation Pre Normal Spirometry





Comment

f 20.03.2017

Normal

PULMONARY MEDICINE OPD PIMS

20020078

PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

A Unit of Mathas Medical Mission

DEPARTMENT OF RADIOLOGY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	: 46 Y(s)/Male
Bill Date	: 20-Mar-2017 08:41 AM	**UMR No.**	: 2017031430429
Sample Coll.	20-Mar-2017 8:41 AM	**Bill No.**	: PR16004155
		Result No	: RES598280
Report Date	: 23-Mar-2017 03:18 PM		
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Lab No**	: 0

XRAY CHEST PA VIEW

The heart shadow is normal.
The aorta is normal.
Mediastinum is normal.
The hilar and bronchovascular markings are normal on both sides.
The lung fields are clear.
Both the domes of diaphragm and CP angles are normal.
Soft tissue and bony thoracic cage are normal.

IMPRESSION

The chest shows no significant abnormality.

Dr. JOSEPH MANUEL
POSTGRADUATE TRAINEE

DEPARTMENT OF RADIODIAGNOSIS PIMS

Verified By : 5676 **Approved By :** **Dispatched By :**

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PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014, Ph : 0413-2651111

DEPARTMENT OF PATHOLOGY

Madras Medical Mission

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	:46 Y(s)/Male
Bill Date	:20-Mar-2017 08:41 AM	**UMR No.**	:2017031430429
Sample Coll.	: 20-Mar-2017 8:53 AM	**Bill No.**	:PR16004155
Sample Rec.	: 20-Mar-2017 12:59 PM	**Result No**	:RES597625
Report Date	: 20-Mar-2017 02:41 PM	**Lab No**	: 0
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: Blood

Parameter	Result Values	Normal Range	Method
BLOOD GROUPING + RH	"AB"NEGATIVE		

*** End Of Report ***

Dr. KINGSLEY, MBBS, MD
ASSISTANT PROFESSOR

MEDICAL OFFICER - BLOOD BANK
PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
GANAPATHICHETTIKULAM, KALAPET,
PONDICHERRY - 605 014.

Suggested Clinical Correlation * If neccessary, Please discuss

Verified By 6670 **Approved By** 5788 **Dispatched By**

20020678

PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014. Ph : 0413-2651111

DEPARTMENT OF MICROBIOLOGY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	:46 Y(s)/Male
Bill Date	:20-Mar-2017 08:41 AM	**UMR No.**	:2017031430429
Sample Coll.	: 20-Mar-2017 8:53 AM	**Bill No.**	:PR16004155
Sample Rec.	: 20-Mar-2017 2:00 PM	**Result No**	:RES597808
Report Date	: 20-Mar-2017 03:15 PM	**Lab No**	: SE-1747
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: BLOOD

WIDAL	**TITRE**
WIDAL TEST	
TO:	<1:20
TH:	<1:20
AH:	<1:20
BH :	<1:20
INTERPRETATION :	TITRES NOT SUGGESTIVE OF ENTERIC FEVER. CONSIDERING THE LOW SPECIFICITY OF WIDAL TEST, PLEASE CORRELATE CLINICALLY.

*** End Of Report ***

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
DEPARTMENT OF MICROBIOLOGY

Shashikala

Dr. SHASHIKALA, MBBS, MD
PROFESSOR

Suggested Clinical Correlation. If necessary, please discuss

Test results relate only to the specimen tested.

Verified By 5392 **Approved By** 0818 **Dispatched By**

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PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014. Ph : 0413-2651111

DEPARTMENT OF PATHOLOGY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	: 46 Y(s)/Male
Bill Date	: 20-Mar-2017 08:41 AM	**UMR No.**	: 2017031430429
Sample Coll.	: 20-Mar-2017 8:53 AM	**Bill No.**	: PR16004155
Sample Rec.	: 20-Mar-2017 11:12 AM	**Result No**	: RES597723
Report Date	: 20-Mar-2017 02:02 PM	**Lab No**	: OP 99
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: URINE

Parameter	Result Values	Normal Range	Method
URINE COMPLETE			
APPEARANCE	CLEAR		
COLOUR	PALE YELLOW	pale / dark yellow	
URINE PH	5.0	4.6 - 8.0	Urine Dipstick
URINE SPECIFIC GRAVITY	1.030	1.003 - 1.035	Urine Dipstick
URINE PROTEIN	NEGATIVE	negative	URINE DIPSTICK/HEAT AND COAGULATION TEST
URINE SUGAR	TRACE	negative	URINE DIPSTICK / BENEDICT'S TEST
URINE KETONE	NEGATIVE	negative	URINE DIPSTICK/ROTHERA'S TEST
URINE BILE SALT	NEGATIVE	negative	Hay's Test
URINE BILE PIGMENTS	NEGATIVE	negative	Urine Dipstick / Fouchet's Test
MICROSCOPY			
RBCs	Nil /hpf	0 - 2 /hpf	
WBCs	2 /hpf	0 - 5 /hpf	
EPITHELIAL CELLS	4 /hpf		
CASTS	NIL		
CRYSTALS	NIL		

*** End Of Report ***

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
Department of Clinical Pathology

Verified By 5151 **Approved By** 6335 **Dispatched By**

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2658272, 2656701 Fax : 0413-2656273

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PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014. Ph : 0413-2651111

DEPARTMENT OF PATHOLOGY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	:46 Y(s)/Male
Bill Date	:20-Mar-2017 08:41 AM	**UMR No.**	:2017031430429
Sample Coll.	:20-Mar-2017 8:53 AM	**Bill No.**	:PR16004155
Sample Rec.	:20-Mar-2017 11:12 AM	**Result No**	:RES597723
Report Date	:20-Mar-2017 02:02 PM	**Lab No**	: OP 99
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: URINE

Parameter	Result Values	Normal Range	Method

Department of Clinical Pathology
PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
PUDUCHERRY-14

Dr. PRADEEP, MBBS, MD,DNB
ASSISTANT PROFESSOR

Suggested Clinical Correlation * If neccessary, Please discuss

Test results related only to the item tested.

Verified By 5151 **Approved By** 6335 **Dispatched By**

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PONDICHERRY INSTITUTE
OF MEDICAL SCIENCES

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

Ganapathichettikulam, Village No.20, Kalapet
Puducherry-605014, Ph : 0413-2651111

DEPARTMENT OF PATHOLOGY

Patient Name	: **Mr. IRUTHAYAM V**	**Age /Sex**	: 46 Y(s)/Male
Bill Date	: 20-Mar-2017 08:41 AM	**UMR No.**	: 2017031430429
Sample Coll.	: 20-Mar-2017 8:53 AM	**Bill No.**	: PR16004155
Sample Rec.	: 20-Mar-2017 11:03 AM	**Result No**	: RES597688
Report Date	: 20-Mar-2017 01:52 PM	**Lab No**	: OP 44
Ref By	: Dr.KURIEN THOMAS MBBS, MD,	**Specimen**	: EDTA Whole Blood

Parameter	Result Values	Normal Range	Method
ESR	05 mm/hour	0 - 15 mm/hour	Westergren 1 hour

*** End Of Report ***

Department of Clinical Pathology
PONDICHERRY-14

Dr. PRADEEP, MBBS, MD,DNB
ASSISTANT PROFESSOR

Please Correlate results with clinical picture. Advised repeat test in case of discrepancy.
Test results related only to the item tested.

Verified By 5151 **Approved By** 6335 **Dispatched By**

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2656272 / 2656700 / 2656701 Fax : 0413-2656273

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Assessment Report

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

A Unit of Madras Medical Mission

Print Date & Time : 21-Apr-2017 02:39 pm **Next Visit Date & Time :** 20-Mar-2017 3:25 pm

Patient Name :	Mr.IRUTHAYAM V	**Age/Gender :**	47 Years / Male	**UMR No :**	2017031430429
Consult Dr :	Dr. NAYYAR IQBAL	**Consult. Dt :**	20-Mar-2017	**Consult. No :**	PI16354687

CHIEF COMPLAINT Notes : -

Notes : CAME FOR GEN HEALTH CHECK UP

PRESENT COMPLAINT Notes : -

Notes : NIL

PAST COMPLAINT Notes : -

Notes :T2DM ON OHA (GLICLAZIDE 40 BD)

PERSONAL HISTORY Notes : -

Notes : NO SMOKING / ALCOHOL

FAMILY HISTORY : -

Marital Status UnMarried

S.No	Relation/Disease	Father	Mother	Spouse	Child	Brother	Sister	Other	Comments
1	DIABETES	No	No	No	No	Yes	No	No	

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
SPECIAL CONSULTATION

Dr. KURIEN THOMAS
MBBS, MD,
Reg.No.34546

PROFESSOR

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2656272/ 2656700/2656701 Fax : 0413-2656273

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PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
A Unit of Madras Medical Mission

Vitals Details : -

Checked By	: 5790	Temperature(F)	: 0.00	Date	: 20-Mar-2017
Height	: 177.00 cms	Body Fat (in %)	: 33.92	BMI	: ###; Pres Obese
Weight	: 87.00 Kg	Pulse	: 88	Diet	:
Respiratory Rate/min	: 0	BSA	: 2.06 m^2	Waist	: 0.00 cms
Head Circume(Cms)	: 0.00			Max Wt.Earli	: 0.00 Kg
* Present BP (Supine)	: 0 / 0	Present BP (Sitting)	: 110 / 70	* Present BP (Standing)	: 0 / 0
* Last BP (Supine)	: 0 / 0	* Last BP (Sitting)	: 0 / 0	* Last BP (Standing)	: 0 / 0

*** Indicates Abnormal Value**

SYSTEMIC EXAMINATION Notes : -

Notes : NAD1
RBS - 213

MEDICINE PRESCRIPTION : -

S.No	Generic Name	Morning	Afternoon	Evening	Night	Days	Qty
Prescription Date: 20-Mar-2017						**Prescription No:**	**GAS268735**
1	GLIMEPIRIDE 2MG TAB (GLIT08)	(1)	x	x	x	(15)	15
	Instruction : BEFORE BREAKFAST						
2	METFORMIN 500MG TAB (XMET03)	(1)	(1)	x	(1)	(15)	45
	Instruction : AFTER MEALS						

Advice : REV AFTER 15 DAYS WITH FBS & PPBS

Notes : T2DM

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES
SPECIAL CONSULTATION

Dr. KURIEN THOMAS
MBBS, MD,
Reg.No.34546

PROFESSOR

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2656272/2656701 Fax : 0413-2656273

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Assessment Report

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

A Unit of Madras Medical Mission

Print Date & Time : 21-Apr-2017 02:39 pm **Next Visit Date & Time :** 20-Mar-2017 12:12 pm

Patient Name :	Mr.IRUTHAYAM V	**Age/Gender :**	47 Years / Male	**UMR No :**	2017031430429
Consult Dr :	Dr. ROHAN SURESH NINAN	**Consult. Dt :**	20-Mar-2017	**Consult. No :**	PI16354688

CHIEF COMPLAINT Notes : -

Notes : CAME FOR REGULAR CHECKUP
VISION6/12PH6/6
6/9PH6/6
ANTERIOR SEGMENT NORMAL
SUB:-0.50CYL*1006/6
-0.50CYL*906/6
NV +1.75SPH N6 BOPTH EYES
FUNDUS(UNDILATED0 NORMAL
GLASS PRESCRIPTION

DIAGNOSIS : -

S.No	Symptom Desc	Diag Type	Diagnosis Cd	Diagnosis	Diagnosis Dt	Treatment	Others
1		Final	H52.13	Myopia, bilateral	10:52:55PM	Treatment Plan :-GLASS PRESCRIPTION	

PONDICHERRY INSTITUTE OF MEDICAL SCIENCES SPECIAL CONSULTATION

Dr. ELFRIDE FAROKH SANJANA

PROFESSOR

Ganapathichettikulam, Village No.20, Kalapet, Pondicherry - 605 014.
Telephone : 0413-2656271 /2656292 /2656700 /2656701 Fax : 0413-2656273

Strides Shasun

Strides Shasun Limited
Bannerghatta Road,
Bangalore - India

Tel. [illegible]
Fax [illegible]
www.[illegible]

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS ON NOVEMBER 20, 2015

Authorisation for execution / signing of documents with Statutory Authorities

RESOLVED THAT the following executives be and are hereby severally authorized to represent the company before the Customs, Directorate General of Foreign Trade (DGFT), Drug Controller of India, Central Excise, Sales Tax and Service Tax, Income Tax Authorities, MEPZ & EOU, Inspector of Factories, Pollution Control Authorities, Planning and other local authorities, Electricity Board, Labour department and any other Governmental Departments, Statutory Authorities, for the proposes connected with or relating to the business affairs, activities, operations and property of the Company as may be necessary or expedient and to make and sign all returns, applications, appeals, references, petitions and other representations, etc. on behalf of the Company to the aforesaid authorities or officers or any of them.

1. Mr. S. Abhaya Kumar
2. Mr. S. Hariharan
3. Mr. N.T. Shekar
4. Mr. E. Ramkumar
5. Mr. P. Velumurugan
6. Mr. K. Jagadeesh
7. Dr. Arun Chandra Karmakar
8. Mr. C. Tamil Maran
9. Mr. Chandrasekaran Appandi
10. Mr. B. Sreedhar
11. Mr. G. Karthikeyan
12. Mr. P. Anand
13. Mr. C.D. Surendran
14. Dr. T. Kannan
15. Mrs. A. Manonmani

FURTHER RESOLVED THAT this resolution shall remain in force till its cancellations / amendment / modification etc. is communicated in writing by the Company.

FURTHER RESOLVED THAT a certified copy of this resolution be forwarded to the concerned authorities from time to time under the signature of any of the directors of the Company or the Company Secretary.

Certified True Copy
For Strides Shasun Limited

Badree Komandur
CFO & Company Secretary

Strides Shasun Limited - (Formerly known as Strides Arcolab Limited) CIN [illegible]
REGD. OFF : [illegible], Devavrata, Sector 17, Vashi, Navi Mumbai 400703 India • Tel [illegible] • Fax [illegible]

Government of India
Ministry of Commerce & Industry
Petroleum & Explosives Safety Organisation (PESO)
No.140, Rukmini Laxmipati Road, Marshalls Road,Egmore,
Chennai - 600008

E-mail : **jtccechennai@explosives.gov.in**
Phone/Fax No : **044 - 28514848,28514848**

No. : **P/HQ/PY/15/1 (P12783)**

Dated : **16/01/2013**

To,

M/s. Shasun Pharmaceuticals Limited,
Shasun Road,
Periakalapet,
Pondicherry,
District: PONDICHERRY,
State: Pondicheri
PIN: 605014

21 JAN 2013

Sub : Existing Petroleum Class **A** Installation at **Plot No, NA, PERJAKALAPEL, PERJAKALAPEL, District: PONDICHERRY, State: Pondicheri, PIN: 999999** - Licence No. **P/HQ/PY/15/1 (P12783)** - granted for XV of Petroleum Rule 2002 **Renewal regarding.**

Sir(s),

Please refer to your letter No.: **x**, dated **03/11/2012**

Licence No. **P/HQ/PY/15/1 (P12783)** dated **17/08/2012** is forwarded herewith duly renewed upto **31/12/2015**.

Please follow the procedure strictly as laid down in rule 148 of the Petroleum Rules, 2002 and submit complete documents for the Renewal of the licence so as to reach this office on or before the date on which Licence expires.

Please acknowledge the receipt.

Note : ~~Your Balance Amount with the Organisation is Rs.155, which will be used for processing of the same Licence in future.~~

Yours faithfully,

(Dr. S K Dixit)
Controller of Explosives
For Jt. Chief Controller of Explosives
Chennai

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

FORM XV
(see Article 6 of the First Schedule)

LICENCE TO IMPORT AND STORE PETROLEUM IN INSTALLATION

Licence No. : **P/HQ/PY/15/1(P12783)** Fee Rs. **3640**/- per year

Licence is hereby granted to **M/s. Shasun Pharmaceuticals Limited, Shasun Road, Periakalapet, Pondicherry, District: PONDICHERRY, State: Pondicheri, PIN: 605014** valid only for the importation and storage of **226.00 KL** Petroleum of the classes and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No **P/HQ/PY/15/1(P12783)** dated **17/08/2012** attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

The Licence shall remain in force till the 31st day of December **2015**

Description of Petroleum	Quantity licenced in KL
Petroleum Class A in bulk	**188.00 KL**
Petroleum Class A, otherwise than in bulk	**38.00 KL**
Petroleum Class B in bulk	**NIL**
Petroleum Class B, otherwise than in bulk	**NIL**
Petroleum Class C in bulk	**NIL**
Petroleum Class C,otherwise than in bulk	**NIL**
Total Capacity	**226.00 KL**

March 7, 1989

Chief Controller of Explosives
HQ, Nagpur

1). Amendment dated - 17/08/2012

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

The licensed premises, the layout , boundaries and other particulars of which are shown in the attached approved plan are situated at **Plot No: NA, PERJAKALAPEL, PERJAKALAPEL, District: PONDICHERRY, State: Pondicheri, PIN: 999999** and consists of **Ten Undergruond Petroleum Class A (tank Nos. 1 To 3 For Hexane, 4 & 5 For Acetone, 6, 9 & 10 For Ipa And 7 & 8 For Methonal) And Storage Shed For Class A Together With Connected Facilities.** together with connected facilities.

Page No. 2

Licence No. P/HQ/PY/15/1 (P12783)

SPACE FOR ENDORSEMENT OF RENEWALS

This licence shall be renewable without any concession in fee for ten years in the absence of contravention of any provisions of the Petroleum Act, 1934 or of the rules framed thereunder or of any of the conditions of this licence	Date of Renewal	Date of Expiry of license	Signature and office stamp of the licencing authority.
1).	16/10/2007	31/12/2009	Sd/-
2).	16/11/2009	31/12/2012	Sd/- S G Kadam
3).	16/01/2013	31/12/2015	Dr. S K Dixit Controller of Explosives For Jt. Chief Controller of Explosives Chennai

This licence is liable to be cancelled if the licensed premises are not found conforming to the description given on the approved plan attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable for the first offence with simple imprisonment which may be extend to one month, or with fine which may extend to one thousand rupees, or with both and for every subsequent offence with simple imprisonment which may extend to three months, or with fine which may extend to five thousand rupees or with both.

भारत सरकार
Government of India
वाणिज्य और उद्योग मंत्रालय
Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो)
Petroleum & Explosives Safety Organisation (PESO)
A और D - विंग, ब्लॉक 1-8, दूसरा तल, शास्त्री भवन, 26 हड्डोउस रोड, नुंगम्बक्कम
चेन्नै- 600006
A & D - Wing, Block 1-8, IInd Floor, Shastri Bhavan, 26 Haddous Road, Nungambakkam, Chennai - 600006

E-mail : jtccechennai@explosives.gov.in

Phone/Fax No : 044 - 28287118,28284848

संख्यां /No. : P/SC/PY/15/15 (P37977)

दिनांक /Dated : 25/04/2017

सेवा में /To,

M/s. STRIDES SHASUN LIMITED,
(formerly known as Strides Arcolab Limited)R.S. No.33 & 34, Mathur Road, Periyakalapet,,
Periakalapet,
Puducherry,
District: PONDICHERRY,
State: Pondicheri
PIN: 605014

विषय /Sub : Survey No, 33,34, PERIYAKALAPET VILLAGE, PERAIKALPET, Taluka: X, District: PONDICHERRY, State: Pondicheri, PIN: 605104 में स्थित पेट्रोलियम वर्ग B अधिष्ठापन - पेट्रोलियम नियम 2002 के अंतर्गत प्ररूप XV में जारी अनुज्ञप्ति सं P/SC/PY/15/15 (P37977) – संशोधन के संदर्भ में।

Existing Petroleum Class B installation at Survey No, 33,34, PERIYAKALAPET VILLAGE, PERAIKALPET, Taluka: X, District: PONDICHERRY, State: Pondicheri, PIN: 605104- Licence No. P/SC/PY/15/15 (P37977) - granted in form XV under Petroleum Rules 2002 - Amendment regarding

महोदय /Sir (s),

कृपया आपके उपर्युक्त विषय से संबंधित पत्र संख्या X दिनांक 18/04/2017 का संदर्भ ग्रहण करें।

Reference to your letter No. X dated 18/04/2017 on the above subject.

दिनांक 31/12/2023 तक वैध अनुज्ञप्ति संख्या P/SC/PY/15/15 (P37977) दिनांक 25/04/2017 निम्नलिखित वर्ग एवं मात्राओं में पेट्रोलियम भंडारण के लिए यथा संशोधित कर इस पत्र के साथ लौटाई जा रही है।

Licence No. P/SC/PY/15/15 (P37977) dated 25/04/2017 valid upto 31/12/2023 is returned herewith duly amended with respect to Lay out Amendment, Capacity Amendment, Corressponding Address Amendment

पेट्रोलियम का विवरण /Description of Petroleum	किलोलीटरों में अनुज्ञप्ति क्षमता /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A, in bulk	NIL
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B, in bulk	48.00 KL
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C, in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	NIL
कुल क्षमता /Total	48.00 KL

कृपया पावती दें।

Please acknowledge the receipt.

भवदीय /Yours faithfully,

((डा. अशोक कुमार यादव))
(Dr Ashok Kumar Yadav))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
चेन्नै
Chennai

Copy forwarded to :-
1. The Additional District Magistrate, PONDICHERRY(Pondicheri) with reference to his NOC No 13930/91/D3 Dated 03/01/1995

प्ररूप **XV**
(प्रथम अनुसूची का अनुच्छेद **6** देखिए)
FORM XV
(see Article 6 of the First Schedule)

अधिष्ठापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN AN INSTALLATION

अनुज्ञप्ति सं. (Licence No.) : **P/SC/PY/15/15(P37977)**

फीस रूपए (Fee Rs.) **1000**/- per year

M/s. STRIDES SHASUN LIMITED, (formerly known as Strides Arcolab Limited)R.S. No.33 & 34, Mathur Road, Periyakalapet,, Periakalapet, Puducherry, District: PONDICHERRY, State: Pondicheri, PIN: 605014 को केवल इसमें यथा विनिर्दिष्ट वर्ग और मात्राओं में पेट्रोलियम **48.00 KL** आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या **P/SC/PY/15/15(P37977)** तारीख **30/05/1996** जो कि इससे उपाबद्ध हैं, में दिखाए गए स्थान पर भण्डारकरण के लिए पेट्रोलियम अधिनियम, 1934 के उपबंधों या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए, यह अनुज्ञप्ति अनुदत्त की जाती हैं।

Licence is hereby granted to **M/s. STRIDES SHASUN LIMITED, (formerly known as Strides Arcolab Limited)R.S. No.33 & 34, Mathur Road, Periyakalapet,, Periakalapet, Puducherry, District: PONDICHERRY, State: Pondicheri, PIN: 605014** valid only for the importation and storage of **48.00 KL** Petroleum of the class and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No **P/SC/PY/15/15(P37977)** dated **30/05/1996** attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति 31st day of December **2023** तक प्रवृत रहेगी।
The Licence shall remain in force till the 31st day of December **2023**

पेट्रोलियम का विवरण /Description of Petroleum	अनुज्ञप्त मात्रा (किलोलीटरों में) /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A in bulk	**NIL**
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	**NIL**
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B in bulk	**48.00 KL**
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	**NIL**
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C in bulk	**NIL**
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	**NIL**
कुल क्षमता /Total Capacity	**48.00 KL**

May 30, 1996

For Jt. Chief Controller of Explosives
SC, Chennai

1). Amendment dated - 30/05/1996
2). Amendment dated - 25/04/2017

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टयां संलग्न अनुमोदित नक्शों में दिखाई गई हैं **Survey No: 33,34, PERIYAKALAPET VILLAGE, PERAIKALPET, Taluka: X, District: PONDICHERRY, State: Pondicheri, PIN: 605104** स्थान पर अवस्थित है तथा उसमें निम्नलिखित **2 Under Ground tank(s) for CLASS B** सम्मिलित हैं |

The licensed premises, the layout , boundaries and other particulars of which are shown in the attached approved plan are situated at **Survey No: 33,34, PERIYAKALAPET VILLAGE, PERAIKALPET, Taluka: X, District: PONDICHERRY, State: Pondicheri, PIN: 605104** and consists of **2 Under Ground tank(s) for CLASS B** together with connected facilities.

AMENDED

FORM-V

(See rule 12(2))

CERTIFICATE OF REGISTRATION FOR EXISTING USER OF GROUNDWATER

Registration No.: P-02-20-01-01775/MI1/RENEWAL/2015 - 16

With reference to their application No. 2206 dated 01.12.2015, **M/s STRIDES SHASUN LIMITED, [Unit – I], Mathur Road, Periakalapet, Puducherry – 605 014,** is hereby granted Certificate of Registration recognising the use of tube well located at **R.S.No. 33** in **Kalapet Revenue Village of Oulgaret Municipality in Puducherry region for Industrial purpose,** confirming to the following specifications:-

(i)	Type of well	: Tubewell
(ii)	Depth	: 220 Metres
(iii)	Diameter	: 200 Millimetres
(iv)	Aquifer tapped	: Cuddalore Sandstone & Vanur Sandstone aquifer
(v)	Type of pump	: Submersible
(vi)	H.P. of the motor pump installed	: 15 H.P.
(vii)	No. of hours operated	: 14 Hrs.
(viii)	Quantity of groundwater extracted per day	: **1,15,000 Litres / day**
(ix)	Quantity of groundwater got transported per day	: XXXXXX
(xi)	Well status	: Functioning

2. This certificate is also subject to the following conditions:-

(i) The certificate holder should not deviate from the specifications regarding the well above-mentioned.

(ii) The Groundwater Authority or any person duly authorized by it shall have the right to enter and inspect the place with such assistance as may be necessary to satisfy whether the conditions and restrictions specified in this certificate are being complied with.

(iii) The Groundwater Authority, for technical reasons may alter, amend or vary the terms of certificate of registration giving 15 days notice to the certificate holder specifying the reasons.

(iv) The certificate holder should maintain a register in Form – VII-(A) and should monthly send a report in Form – VIII – (A) appended.

(v) Any other conditions (to be specified).

(a) This certificate is valid till 31/03/2017.

(b) The total drawl of groundwater from the tubewell should not exceed 1,15,000 lts per day.(i.e. 1,10,000 lts for Unit – I and 5,000 lts for Unit – II).

Contd...

(c) The certificate holder should maintain the daily water consumption register strictly in accordance with Form – VII – A, at Unit – I.

(d) The certificate holder should submit the said monthly report strictly in accordance with Form –VIII-(A) **(enclosed herewith)** before the tenth day of every succeeding month.

(e) A copy of this Certificate of Registration should be kept in the industry and the same has to be shown during the inspection of Government officials.

(f) The certificate holder should apply for renewal in Form-IV **(enclosed herewith)** to this authority, before 90 days of its validity period i.e. on or before 31.12.2016.

(g) Any deviation / Violation of the above mentioned conditions will attract penal action as per the sub – section (b) (i) & (ii) of Section 20 of "The Pondicherry Ground Water (Control & Regulation) Act" [(i) for the first offence with fine which may extend to five thousand rupees: and (ii) for the second and subsequent offence, with imprisonment for a term which may extend to six months, or with fine which may extend to ten thousand rupees, or with both].

(h) This Certificate of Registration will liable for cancellation, if your firm failed to comply with the conditions stipulated in this Certificate of Registration, as per Sub Section (b) of Section 12 of "The Pondicherry Groundwater (Control & Regulation) Act,2002".

Place: Puducherry
Date : 30.12.2015

Signature of the Member Secretary
Groundwater Authority
30/12/15

Strides Shasun

Strides Shasun Limited
R.S No. 33 & 34,
Mathur Road,
Periyakalapet,
Puducherry – 605 014, India

Tel : +91 413 2654100
Fax : +91 413 2655154
info@stridesshasun.com
www.stridesshasun.com

SSL/SGWA/Form- IV-Renew/2016-17/068 26.12.2016

The Member Secretary,
Pondicherry Ground Water Authority,
15-VI-Cross, Mariamman Nagar, Karamanikuppam,
Puducherry 605 004.

Dear Sir,

Sub: Renewal of Industrial Bore Well – Reg
Ref: Certificate Registration. No. P-02-20-01-01775/MI 1- Valid up to 31.03.2017

With reference to the above, here with we are enclosing FORM- IV – (See rule12(1)) and request you to kindly Renew the Industrial bore – well for further two years from 01.04.2017 to 31.03.2019.

Necessary renewal payment will be paid as per act.

Kindly renew the same at the earliest please.

Thanking you,

for **STRIDES SHASUN LIMITED**

C. TAMILMARAN
Asst – Vice President

27/12/2016
RECEIVED
Pondicherry Ground Water Authority
Puducherry

Encl: a/a
a) Form IV Duly filled and signed
b) Form – V - P-02-20-01775/Mi1 (Original Enclosed)

FORM - IV
{see rule-12(1)}

APPLICATION FOR GRANT OF CERTIFICATE OF REGISTRATION OF EXISTING USER OF GROUNDWATER

1	(I) Name of the applicant	**C. TAMILMARAN (Asst. Vice President)**
	(ii) Age in years	**STRIDES SHASUN LIMITED**
	(iii) Father's / Husband's name	**API - UNIT**
	(iv) Full address	**MATUR ROAD PERIAKALAPET,**
		PUDUCHERRRY 605 014
	(v) Telephon No.	**0413-2654115**
2	**Location**	
	(I) R.S. No.	**33 & 34**
	(ii) Name of the village	**PERIAKALAPET,**
	(iii) Name of the Commune	**OULGARET MUNICIPALITY**
3	**Details of the existing well:-**	
	(I) Type of well	**Dugwell / Dug-cum Borewell / Tubewell**
	(ii) Diameter	**200 Millimeter**
	(iii) Depth	**220 Metres**
	(iv) Power Policy No	**139**
	(v) Actual Discharge	**1,10,000 Ltrs/ PD- + 500 ltr/Pd for Unit-II**
	(vi) Type of Pump	**Submersible**
	(vii) Horse Power	**15 HP**
	(viii) No. of Hrs operated / day	**14 Hrs**
	(ix) Year of construction	**Existing**
4	Permit No Issued by Ground Weater Authority with date, if any	**No. P-02-20-01-01775/MI 1 RENEWAL-31.03.2015**
5	Purpose for which used	**Agriculture / Domestic / Industrial**
6	If used for Agriculture purpose	
	(I) Status of former	**Marginal former / Smal former / Big former**
	(ii) Total Ext. of Land owned	**.---------- NA----------.**
	(iii) Ext. of Land irrigated	
	(iv) Type of Crop	
7	**If used for Domestic Purpose**	**Industrial Purpose**
	(I) Total numbers of person	**1000 Employees**
	(ii) Quantity of water pumped per day	**1,10,000 litres P/D + 5 KL = 1,15,000 ltr/PD**

8

(I)	Type of Industry	**Pharmaceuticals / Formulation**
(ii)	No. of persons engaged	**1000 employees**
(iii)	Quantity of water used for Industrial purpose	**105 KL/PD**

9 If water is to be used by transportation .----------NA----------.

(I) Purpose
(ii) By whom transported
(iii) From where transported
(iv) Mode of transport
(v) Registration No. of the transport Vehicle
(vi) Wheter consent of thw owner of the source obtained (copy to Be enclosed)

9 If the applicant is not the land-owner whether the consent of the land-owner is obtained (copy to be enclosed) **Own Land**

DECLARATION

I, C. TAMILMARAN, Asst. Vice President) to hereby solemnly affirm and state that the informationgiven in the above application is true and correct to the best of my knowledge and belief.

I further declare that I am making this application in my capacity as Asst. Vice President and that I am Competent and authorized to make this application and to verify it.

Place : Puducherry
Date

for STRIDES SHASUN LIMITED

C. TAMILMARAN
Asst. Vice President

GCPP—225/1 — 100 Bks. x 50 Sets—3-9-2010.

PONDICHERRY GROUND WATER AUTHORITY

PUDUCHERRY

RECEIPT

No. 3154

ORIGINAL

Date 28/8/2017

Received from Stódes Sharma Ltd, unit I

(Address) Periakalapet.

with letter No. PO2/-20-01-01775/M11/R dated 30/12/15 the sum of Rupees One thousand only

in Cash / by Cheque / by Bank Draft on account of the fee payable for the grant of (a) Permit to Sink a Well; (b) Certificate of Registration of Existing Use; (c) Grant / Renewal of License for Sinking of Well for Extraction / Transport of Ground Water; or (d) Others [specify]

Renewal of CR 2017 - 19

₹ 1000 —

Member - Secretary

Sl. No.	Year	Products		EC No	CTE No	CTO No	Remarks
		Name	TPA				
1.	1986-1987			-	-	F.12/6(739)/86NOC/SOP/39	
2.	1987-1989			-	-	F.12/6(128)/87/CON/SOP/1462	
3.	1989-1991			-	-	F.12/6(128)/87/CON/SOP/-do-	
4.	1991-1992			-	-	F.12/6(128)/87/CON/SOP	
5.	1993-1994	Ibuprofen, PMP, Chloroheniramine Maleate,Pheiramine Maleate, Aluminum Chloride, Sodium Sulphate, Basic Chromium Sulphate		-	-	DSTE/CON/93-94/1369	
6.	1995-1995	Ibuprofen, Aluminum chloride, PMP, Chloroheniramine Maleate,Pheiramine maleate, Sodium sulphate, Basic chromium sulphate		-	-	DSTE/CON/JE-II/94-95/308	
7.	1997-1998	Ibuprofen 100 TPM, Semi finished organic chemicals - 140 TPM	2800	-	-	PPCC/CON/OM/JE-II/96/349	
8.	1998-1999	Ibuprofen100 TPM,	1200	-	-	PPCC/CON/OM/JE-II/98/1175	
9.	1999-2000	Ibuprofen 100 TPM,	1200	-	-	PPCC/CON/OM/JE-II/99/1141	
10.	2001-2002	IIbuprofen100 TPM,	1200	-	-	PPCC/CON/OM/JE-II/2001/550	
11.	2002-2003	Ibuprofen100 TPM, Ibuprofen dc 20 TPM , S.Naproxen 20 TPM	1680	-	-	PPCC/CON/WTR/OM/EE/2002/2877	
12.	2004-2005	Ibuprofen 100 TPM, Ibuprofen dc-20 TPM S.Naproxen 20 TPM	1680	-	-	PPCC/CON/WTR/OM/JE-II/2004/2045	
13.	2005-2006	Ibuprofen 100 TPM, Ibuprofen dc-20 TPM, S.Naproxen 20 TPM,	1680	-	-	PPCC/CON/WTR/OM/JE-II/2004/3576	

14.	2006-2007	Ibuprofen 100 TPM, Ibuprofen dc-20TPM S.Naproxen 20 TPM	1680	-	-	PPCC/CON/WTR/OM/JE/2006/1690	
15	[illegible]	Ibuprofen 340 TPM, Ibuprofen dc-20 TPM , Ibuprofen derivative 20 TPM, Carisoprodol 20 TPM and Pilot scale operation for R&D	4800	-	-	9/PPCC/CON/WTR/OM/JE/2009/486	
16 ~~17~~	2011-2012	Ibuprofen 340 TPM, Ibuprofen dc - 20 TPM Ibuprofen derivative 20 TPM, Carisoprodol 20 TPM and Pilot scale operation for R&D	4800	-	-	9/PPCC/CON/WTR/OM/JE/2011/404	
17 ~~19~~	2014-2016	Ibuprofen 340 TPM, Ibuprofen dc -20 TPM Ibuprofen derivative 20 TPM, Carisoprodol 20 TPM and Pilot scale operation for R&D	4800	-	-	9/PPCC/CON/WTR/OM/JE/2014/1003	
18 ~~21~~	2017-2018	Ibuprofen 340 TPM, Ibuprofen dc -20 TPM Ibuprofen derivative 20 TPM, Carisoprodol 20 TPM and Pilot scale operation for R&D	4800	-		NO. 7528/PPCC/CON/WTR/OM-KAL/JE-11/2017/1453 NO. 7528/PPCC/CON/AIR/OM-KAL/JE-11/2017/1454	
19 ~~22~~	2017-2018	Ibuprofen 359 TPM, Ibuprofen dc 20 TPM, Ibuprofen derivative 20 TPM, Carisoprodol 1 TPM and Pilot scale operation for R&D	4800	-		No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/1655 Dt: 23rd Mar 2017 No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/1656 Dt: 23rd Mar 2017	
20 ~~23~~	2017-2018	Ibuprofen 359 TPM, Ibuprofen dc 20 TPM, Ibuprofen derivative 20 TPM, Carisoprodol 1 TPM and Pilot scale operation for R&D	4800	-	No. 7528/PCC/NOC/OM/JE/2015/882	No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/1699 Dt: 31 Mar 2017 No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/1700 Dt:31 Mar 2017	
21 ~~24~~	2017	Existing 5 no.s products	4800	Current Application	-	No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/1699 Dt: 31 Mar 2017	New addition. Existing 5 nos products retained - 4356 TPA
		After Change in product mix 8 no.s Products	9156			No. 7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/1700 Dt:31 Mar 2017	New added 3 nos products

CENTRAL BOARD FOR THE PREVENTION & CONTROL OF WATER POLLUTION.
REGIONAL OFFICE :: PONDICHERRY-605 011.

F.12/6(739)/86/RO C/PDY/ 39 Dt. 6th Jan. 1986.

To

The Manager, (FI & RET),
District Industries Centre,
Government of Pondicherry,
PONDICHERRY-605 011.

Sir,

Sub: No Objection Certificate from Pollution Angle to M/s. Shasun Drugs.

Ref: Your letter No.2007/Ind/85/A3, Dt. 30-12-85.

-C-C-C-C-

The Central Board for the Prevention & Control of Water Pollution has no objection to permit M/s. Shasun Drugs, No.3, DR's Colony, Pondicherry-605 013 to set up the proposed industry at PeriaKalapet, Pondicherry state, subject to the following conditions:-

1. The quantity of waste water shall not exceed the following:-

a) Domestic : 5.0 KLD
b) Industrial : 25.0 KLD

2. The strong process effluents from the PMP plant etc., shall be segregated and either force evaporated or shall be discharged through a well laid marine outfall extending 500 mt. into the sea with a diffuser system at the end after meeting the following standards:-

a) Temp (°C) - Not more than 45° at the point of discharge.
b) pH 5.5 To 9.0
c) Oil & grease - 20 mg/l
d) Total Residual Chlorine - 1 mg/l
e) Ammonical Nitrogen - 50 mg/l
f) Total Kjedahl Nitrogen - 100 mg/l
g) Free Ammonia - 5 mg/l
h) BOD - 100 mg/l
i) COD - 250 mg/l
j) Total Chromium - 2 mg/l
k) Zinc - 15 mg/l
l) Fluorides - ~~8X~~ 15 mg/l
m) Cyanides - 0.2 mg/l

3. The Chromium bearing effluents will be treated to precipitate the chromium by reducing hexavalent chromium to trivalent chromium by sodium bisulphate and precipitating trivalent chromium as chromium hydroxide using lime. The sludge so produced shall be so disposed without causing any groundwater pollution problem.

4. The rest of the industrial effluents shall be mixed with the floor wash, filter cloth wash, boiler blowdown and canteen effluents and then treated so that the treated effluents shall conform to the following standards:-

pH	5.5 to 9.0
TDS	1000 mg/l
TSS	600 mg/l
BOD	100 mg/l
COD	250 mg/l
Phenols	1.0 mg/l
Cyanide	0.2 mg/l
Soaps & Detergents	- 1.0 mg/l
Oil & grease	10 mg/l
% Sodium	60

The treated effluents shall be disposed on the factory's own lands for gardening purposes.

ENTRAL BOARD FOR THE PREVENTION AND CONTROL OF WATER POLLUTION.

CONSENT ORDER NO: F.12/6(128)/87/CON/SDP./1462

(In Renewal of Previous Consent OrderNO -do-

Dt 15-1-1987.

Pollution file

To

M/s. SHASUN DRUGS,
SHASUN ROAD,
PERIAKALAPET,
PONDICHERRY STATE.

Consent is hereby granted for discharge of the effluent from your factory/premises under Section 26 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and conditions:-

1. This Consent is valid upto : 31-12-1989

2. The maximum daily discharge shall not exceed the following:-

Type of effluent	Maximum daily discharge (KLD)
a) Domestic	5.0
b) Industrial (Process, Floor and equipment washing, cooling and bleed water)	55.0

3. a) The domestic waste water shall be treated in a Septic Tank followed by soil absorption system ~~or~~ through metal filter.
~~XXXXXXXXXXXXXXXXXXXX~~

b) The industrial effluent shall be treated, before disposal as per Clause No.4, so as to conform to the standards stated below:-

S.No.	PARAMETERS	LIMITS.
1	Temperature	Shall not exceed 5°c above amb. temp
2	Ph	6.1 mg/l
3	Total Chromium	2.0 mg/l
4	FOG value	100 mg/l
5	Oxygen Absorbable test	150 mg/l
6	COD	250 mg/l
7	BOD	250 mg/l.

4. Industrial effluent (after treatment where necessary) shall be discharged through one outlet into the Sea at 500 Mts., distance by submarine pipeline.

5. Implementation Schedule:-

1. Effluent treatment plant shall be well maintained to achieve the prescribed standards.
2. Whenever required, further modification in treatment plant shall be taken up and completed within 90 days from the date of communication.
3. Monthly analytical results shall be submitted to the Board.
4. Relevant clearances shall be taken from the State Government Department with respect to Water abstraction as and when required.

.....2

6. Samples of treated industrial shall be collected at the terminal manhole once in a week/fortnight/Month/Three Months / Six Months/Year, on any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed vide condition No3 stated above. Reports of analysis shall be submitted to this Board regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS: 4733 and IS: 2480 as the case may be for domestic and industrial effluents.

7. The applicant shall make an application for renewal of consent in the prescribed form in triplicate at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

8. All conditions and instructions as provided in the "General conditions for consent to discharge Trade effluents" as enclosed herewith are to be strictly followed.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere within and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eculyptus, Su-babal or any suitable variety) of trees at the density of not less than 1000 trees per acre and all along the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter of Consent, the Central Board reserves to it the right and power under Section 27(2) of the Water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the prupose of the Act, by the Central Board.

MEMBER SECRETARY.

Copy to:

1. The Officer-In-Charge, CBPCWP, SDP.
2. The Secretary, Local Administration, Government of Pondicherry, Pondicherry-1.
3. The Officer-in-Charge (Implementation Wing), CBPCWP, NEW DELHI.

MEMBER SECRETARY.

CENTRAL BOARD FOR THE PREVENTION AND CONTROL OF WATER POLLUTION.

CONSENT ORDER NO: F.13/6(120)/87/CON/BP.

(In Renewal of previous Consent Order No -do-

Dt. 17-5-89

To

M/s. Shasun Drugs Limited,
Shasun Road,
Peria Kalapet,
PONDICHERRY STATE.

Sir,

Consent is hereby granted for discharge of effluent from your factory/premises under Section 26 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and Conditions:-

1. This consent is valid upto : 31-3-91

2. The maximum daily discharge shall not exceed the following:-

Type of Effluent.	Maximum daily discharge (in KLD)
a) Domestic	5 KLD
b) Industrial (Process, Floor and equipment washing colling and bleed Waters)	55 KLD

3. a) The domestic waste waters shall be treated in a Soptic Tank followed by soil absorption system.

b) The industrial effluent shall be treated, if necessary, before disposal as per Caluse No.4, so as to conform to the standards stated below:-

S.No.	PARAMETERS	LIMITS.
1.	pH	5.5 - 9.0
2.	Oil & Grease	20 mg/l
3.	S.S.	100 mg/l
4.	BOD	~~300 mg/l~~ 100 mg/l days
5.	Phenols as C_6H_5OH	5.0 mg/l
6.	Hexavalent Chromium	1.0 mg/l
7.	Total Chromium	2.0 mg/l
8.	~~Oxygen absorption test~~	60 mg/l

4. Industrial effluent (after treatment ~~where~~ shall be discharged through one outlet ~~each~~ into the Sea 500 mt., offshore by submarine outfall with a diffuser at the end.

5. Implementation Schedule:-

1. The quantities of products shall not be increased without a prior consent of this Board.
2. Industry shall not discharge waste water without meeting the standards prescribed under Caluse (3) above.
3. The industry should achieve Bio-assay test with 100% effluents concentrations for 96 hours for 90% survival within 90 days from the date of issue of this Consent Order. Necessary modifications in the effluent treatment shall be done.
4. All the solid waste generated from the process operations and effluent treatment plant shall be properly collected in lined tanks at the factory premises and shall not cause surface or subsoil water pollution directly or indirectly.

CENTRAL BOARD FOR THE PREVENTION AND CONTROL OF WATER POLLUTION.

CONSENT ORDER NO: F.12/6(128)/87/CON/SOF, Dt. 20.11.91

(A)

(In Renewal of Previous Consent Order NO -do- Dt 31-10-90

To

M/s. Shasun Drugs Limited,
Shasun Road,
Paria Kalapet,
PONDICHERRY STATE.

Consent is hereby granted for discharge of the effluent from your factory/premises under Section 26 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and conditions:-

1. This Consent is valid upto : 31-7-1992

2. The maximum daily discharge shall not exceed the following:-

Type of effluent	Maximum daily discharge (KLD)
a) Domestic : :	5.0 KLD
b) Industrial (Process, Floor and equipment washing, cooling and bleed water) :	55.0 KLD

3. a) The domestic waste water shall be treated in a septic tank followed by soil absorption system or through ~~soak pit~~ for soil absorption.

b) The industrial and domestic effluent shall be treated combinedly before disposal as per Clause No.4, so as to conform to the standards stated below:-

S.No.	PARAMETERS	LIMITS.
1.	pH	5.5 - 9.0
2.	Oil & Grease	20 mg/l
3.	S.S.	100 mg/l
4.	BOD	100 mg/l
5.	Phenols as C_6H_5OH	5.0 mg/l
6.	Hexavalent Chromium	1.0 mg/l
7.	Total Chromium	2.0 mg/l

Combined (Ind. & Domestic)

4. The effluent (after treatment where necessary) shall be discharged into the Sea 500 mt., offshore by submarine outfall with a diffuser at the end.

5. Implementation Schedule:-

i) Flow Meters should be arranged for measuring the water and effluents quantity.

ii) Industry shall not discharge the waste water without meeting the standards prescribed under Clause (3) above.

iii) The industry should achieve Bio-assay test with 100% effluents concentrations for 96 hours for 90% fish survival within 90 days from the date of issue of this consent order. Necessary modifications in the treatment plant shall be done.

iv) All the solid waste generated from the process operations and effluent treatment plant shall be properly collected in lined tanks at the factory premises and shall not cause surface or subsoil water pollution directly or indirectly. 2

Samples of treated industrial effluent shall be collected at the terminal manhole once in a Week/fortnight/Month/Three Months/ Six months/Year, on any fixed working day of normal production and dhs shall be analysed for all the parameters in respect of which limits have been fixed vide condition No.3 stated above. Reports of analysis shall be submitted to this Board regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS:4733 and IS: 2488 as the case may be for domestic and industrial effluents.

7. The applicant shall make an application for renewal of consent in the prescribed form in triplicate at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

8. All conditions and instructions as provided in the "General conditions for consent to discharge Trade Effluents" as enclosed herewith are to be strictly followed.

9. The role of trees in removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important rule in purifying atmosphere within and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eculyptus, Su-babal or any suitable variety) of trees at the density of not less than 1000 trees per acre and all along the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter of Consent, the Central Board hereby reserves to it the right and power under Section 27(2) of the Water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed ~~fit for t~~ fit for the purpose of the Act, by the Central Board.

MEMBER SECRETARY.

Copy to:

1. The Environmental Engineer, CBPCWP, SEC. Office, Pondicherry.
2. The Secretary, Local Administration, Government of Pondicherry, Pondicherry-605 001.
3. SEE (Implementation), CBPCWP, New Delhi-110019.

MEMBER SECRETARY.

GENERAL CONDITIONS FOR CONSENT TO DISCHARGE OF TRADE EFFLUENTS.

1. Separate conduit system shall be provided for collecting industrial (Process, cooling, bleed waters, floor and equipment washing etc.,) and domestic effluents. Terminal manholes shall be provided at the end of each collection or treatment system with arrangements for measurement of flow and for taking samples. Storm water drains shall be kept separate from the domestic/industrial effluents.

2. Any upset condition in any of the plant/plants of the factory which is likely to result in increased effluent discharge/and/or result in violation of standards mentioned in condition No.3 above shall be reported to this Board telegraphically under intimation to the Secretary, Local Administration, Government of Pondicherry and to the Administrator, Karaikal, Mahe, Yanam Regions.

3. The applicant shall maintain good house-keeping both within the factory and in the premises. All pipes, Valves, sewers and drains shall be leakproof. Floor Washing shall be admitted into the effluent collection system only and shall not be allowed to find their wat in storm drains or open areas subject to their conditions.

4. The applicant shall provide facilities for collection of samples by the Board staff or by any Agency authorised by the Board, at terminal manhole and terminal outlet.

5. The applicant/company shall comply with and carryout directives/orders issued by the Board in this consent order and at all subsequent times without any negligence on his/its part. The applicant/company shall be liable for such legal action against him as per provisions of the Law/Act in case of disobedience of any order/directives issued at any time and/on violation of the terms and conditions of this Consent Order.

6. The applicant shall not change or alter the quality/quantity, the rate of discharge, the temperature of the effluents and also the point of final outlet without the prior written permission from the Board.

7. The conditions imposed on above shall continue in force until revoked under Section 27(2) of the Act.

8. All solid wastes arising in the factory premises shall be properly graded and disposed of by:-

   i) Landfill, in case of inert material, care being taken to ensure that the material does not give rise to lechate which may percolate in ground water or carried away with storm run off.

   ii) Controlled incineration, whereever possible in case of combustible organic material.

   iii) Compositing, in case of bio-degradable material.

9. Any toxic material shall be detoxicated if possible, otherwise shall be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The permission of detoxication or sealing and burying shall be carried out in the presence of Boards' authorised person only.

10. An inspection Book shall be opened and made available to the Board Officers during their visit to the factory.

11. The applicant shall provide proper and efficient flow measurement at the end point of treatment plant, before final disposal.

12. The applicant shall furnish to the visiting Officer and/or/Board any information regarding the construction, installation and operation of the establishment or of effluent control system and such other particulars as may be pertient to preventing and controlling pollution of Water.

13. The above general conditions may be modified by the Central Board from time to time and copies of such modified conditions will be communicated to the parties concenred by Registered Post.

MEMBER SECRETARY.

DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT.

CONSENT ORDER NO. DSTE/CON/93-94/1369

(5)

To

Dated:

M/s. Shasun Drugs Limited,
Shasun Road,
Periyakalapet,
Pondicherry State.

8 NOV 1993

Consent is hereby granted for discharge of the effluent from your factory/premises under Section 25 of the Water(Prevention and Control of Pollution)Act,1974, subject to the following terms and conditions:-

1. This consent is valid upto : 31.10.94.
2. Product : Ibuprofen, PMP, Chlorohenir amine Maleate, Pheniramine Maleate, Aluminium Chloride, Sodium Sulphate Basic Chromium Sulphate.
3. The maximum daily discharge shall not exceed the following:-

Type of effluent		Maximum daily discharge(KLD)
a). Domestic	:	5.0 KLD.
b). Industrial(Process, Floor and equipment washing, cooling and bleed water)	:	55.0 KLD

3. a) The industrial and domestic effluent shall be treated, combinedly before disposal as per clause No.4.so as to conform to the standards state below:-

Sl.No.	PARAMETERS	LIMITS
1.	pH	5.5-9.0
2.	Oil & Grease	20 mg/l
3.	S.S.	100 mg/l
4.	BOD	100 mg/l
5.	Phenols as C_6H_5OH	5.0 mg/l
6.	Hexavalent Chromium	1.0 mg/l
7.	Total Chromium	2.0 mg/l

4. Combined(Ind.&Domestic) effluent(after treatment where necessary) shall be discharged into the Sea 500 mts. Off shore by submarine outfall with a diffuser at the end.
5. Implementation schedule:

(i) Flow Meters should be arranged for measuring the water and effluents quantity.(ii)Industry shall not discharge the waste water without meeting the standards prescribed under clause(3) above.(iii) The Industry should achieve Bio-assay test with 100% effluents concentrations for 96 hours for 90% fish survival within 90 days from the date of issue of this consent order.(iv). All the solid waste generated from the process operations and effluent treatment plant shall be properly collected in lined tanks at the factory premises and shall not cause surface or sub-surface or soil pollution directly or indirectly.(v) Parameters like BOD and oil and grease shall be brought down with the limits and the industry shall intimate the same to the Department within a fortnight.

6. Samples of treated industrial shall be collected at the terminal manhole once in a week/fortnight/month/Three months/six months/ year, on any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed vide condition No.3 stated above. Reports of analysis shall be submitted to this Department regularly or immediately after the analysis is completed. Methods of sampling/

....2/-

sampling and testing shall be as per IS:4733 and IS:2480 as the case may be for domestic and industrial effluents.

7. The applicant shall make an application for renewal of consent in the prescribed form in triplicate at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

8. All conditions and instructions as provided in the "General conditions for consent to discharge Trade effluents" as enclosed herewith are to be strictly followed.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere within and as well as Municipal treatment plants, In view of this, the applicant shall plant minimum three varieties(Eculyptus, subabal or any suitable variety) of trees at the density of not less than 1000 trees per acre and all along the boundries of the industry premises.

10. Not withstanding anything contained in this conditional letter of consent, the Department of Science, Technology & Environment reserves to it the right and power under section 27(2) of the Water(Prevention and Control of pollution)Act,1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Department of Science, Technology & Environment.

Y9

(6)

DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT

CONSENT ORDER NO DSTE/CON/JE-II/98-95/ 308

DATED: 1.3.95

TO,
M/s, Shasun Drugs Ltd,
Shasun Drugs Road,
Periyakalapet,
Pondicherry State.

Consent is hereby granted for discharge of the effluents from your factory/premises under Section 25 of the Water(Prevention and Control of Pollution)Act,1974, subject to the following terms and conditions:-

1. This Consent is valid upto : 31.12.95.
2. Manufacturing Product : Aluminium Chloride, Ibuprofen, PMP, Chloroheniramine Maleate, Pheniramine Maleate, Sodium sulphate, Basic Chromium Sulphate.
3. The maximum daily discharge shall not exceed the following:

Type of effluent	Maximum daily discharge(KLD)
a) Domestic	: 5.0 KLD
b) Industrial(process, Floor and equipment washing, cooling and bleed water)	: 55.0 KLD

4. a) The domestic waste water shall be treated in a septic tank followed by soil absorption system or through metal filter for soil absorption.

b) The industrial effluent shall be treated, before disposal as per clause No.4, so as to conform to the standards stated below:

Sl. No.	PARAMETERS	LIMITS
1.	pH	5.5-9.0
2.	Oil & Grease	20 mg/l
3.	S.S.	100 mg/l
4.	BOD	100 "
5.	Phenols as C6 H5 OH	5.0 "
6.	Hexavalent Chromium	1.0 "
7.	Total Chromium	2.0 "

c) Industrial effluent(after treatment where necessary) shall be discharged.

d) Combined(Ind.&Domestic) effluent(after treatment where necessary) shall be discharged into the Sea 500 mts.off shore by submarine outfall with a diffuser at the end.

Implementation Schedule:-

(i) Flow Meters should be arranged for measuring the water and effluents quantity. (ii) Industry shall not discharge the waste water without meeting the standards prescribed under clause(3) above. (iii) The Industry should achieve Bio-assay test with 100% effluents concentrations for 96 hours for 90% fish survival within 90 days from the date of issue of this consent order. (iv) All the solid waste generated from the process operations and effluent treatment plant shall be properly collected in lined tanks at the factory premises and shall not cause surface or sub-surface or soil pollution directly or indirectly. (v) Parameters like BOD and oil and grease shall be brought down within the limits and the industry shall intimate the same to the Department within a fortnight.

7. Samples of treated industrial shall be collected at the terminal manhole once in a week/fortnight/month/Three months/ six months/year, on any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed vide condition No.3 stated above. Reports of analysis shall be submitted to this office regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS: 2480 as the case may be for domestic and industrial effluents.

8. The applicant shall make an application for renewal of consent in the prescribed form in triplicate at least 30 days before the date of expity of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

9. All conditions and instructions as provided in the "General conditions for consent to discharge Trade effluents" as enclosed herewith are to be strictly followed.

10. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere within and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties(Eculptus, Su-babal or any suitable variety) of trees at the density of boundaries of the industry premises.

11. Not withstanding anything contained in this conditional letter of consent, the Department of Science,Technology and Environment reserves to it the right and power under section 27(2) of the water(Prevention and control of pollution)Act,1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act,by the Department of Science, Technology and Environment.

MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL
COMMITTEE.

S.R./-

lined tanks at the factory premises and shall not cause surface or sub-surface or soil pollution directly or indirectly.(v) Parameters like BOD and oil and grease shall be brought down within the limits and the industry shall intimate the same to the Department within a fortnight.

GOVERNMENT OF PONDICHERRY

DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT

PONDICHERRY POLLUTION CONTROL COMMITTEE

3rd Floor, Housing Board Complex, Anna Nagar, Pondicherry-5

Phone: (0413)—34056.

(7)

WATER CONSENT ORDER - RENEWAL

No.: PPCC/CON/OM/JE-II/96/83 (c). Pondicherry, the 21-02-1997.

To

M/s. Shasun Drugs., Kalapet, Pondicherry.

Consent is hereby granted/renewed for discharge of effluent from M/s. Shasun Drugs., Kalapet, Pondicherry. under section 25 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and conditions,

1. Consent is valid upto : 31.01.1998
2. Manufacturing Products : Ibuprofen - 100 TPM
   Semi finished organic chemicals-140 TPM
3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD)

	Requirment	Discharge
(a) Domestic :	5.0	5.0
(b) Industrial :	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below:

Sl. No.	Parametres	Limits
1.	PH	5.5 - 9.0
2.	TSS	100 Mg/liters
3.	BOD	100 "
4.	xxxxxx Phenols as C6H5OH	5.0 "
5.	O & G	20 "
	Hexavalent Chromium	1.0 "
	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be recycled/discharged on land within the premises.

7. IMPLEMENTATION SCHEDULE:

into sea 500 meters off shore by submarine outfalls with a diffuser at the end.

Pollution file

8. Samples of treated industrial shall be collected at the terminal manhole once in a week/ ortnight/month/three months/six months/year. On any fixed working day of normal production and hall be analysed for all the parameters in respect of which limits have been fixed *vide* condition o. 5 stated above. Reports of analysis shall be submitted to this office regularly or immediately after he analysis is completed. Methods of sampling and testing shall be as per IS: 2480 as the case may be or domestic and industrial effluents.

9. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

10. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere whithin and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eucalyptus Subbabal or any suitable variety of trees) at the density of boundaries of the industry premises.

11. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

12. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

for and on behalf of PPCC

MEMBER-SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to:

1. The Director Industries Department, Pondicherry
2. The Commissioner / DM

8

GOVERNMENT OF PONDICHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PONDICHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Pondicherry-5
Phone: (0413)—34056.

WATER CONSENT ORDER (RENEWAL)

No. PPCC/CON/OM/JE-II/98/1175 Pondicherry, the 31/3/98

To M/s. SHASUN CHEMICALS AND DRUGS LTD.,
KALAPET,
PONDICHERRY.

Consent is hereby granted/renewed for discharge of effluent from M/s. SHASUN CHEMICALS AND DRUGS LTD., KALAPET, under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions,

1. Consent is valid upto : 30.01.99
2. Manufacturing Products : IBUPROFEN – 100 TPM
3. The maximum daily water requirement/effluent dicharge shall not exceed the following (in KLD)

	Requirment	Discharge
(a) Domestic	5.0	5.0
(b) Industrial	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.
5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below.

Sl. No.	Parametres	Limits
1.	PH	6.5 – 8.5
2.	TSS	100 mg/lit
3.	BOD	100 mg/lit
4.	~~COD~~ PHENOLS AS C6H5OH	5.0 "
5.	O & G	20 " "
	HEXAVALENT CHROMIUM	1.0 "
	TOTAL CHROMIUM	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be ~~recycled~~/discharged on land within the premises.
7. IMPLEMENTATION SCHEDULE:

THE INDUSTRIAL EFFLUENT AFTER TREATMENT SHALL BE DISCHARGED INTO SEA 500 MTS OFF SHORE BY SUBMARINE OUTFALLS WITH A DIFFUSER AT THE END. The unit shall take all necessary steps to recycle/conserve the treated effluent wherever [illegible] is possible to inform the dept. on the action taken in this [illegible]

8. Samples of treated industrial shall be collected at the terminal manhole once in a week/ fortnight/month/three months/six months/year. On any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed *vide* condition No. 5 stated above. Reports of analysis shall be submitted to this office regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS : 2480 as the case may be for domestic and industrial effluents.

9. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

10. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere whithin and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eucalyptus Subbabal or any suitable variety of trees) at the density of boundaries of the industry premises.

11. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act, 1974, to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

12. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

For on behalf of
Pondicherry Pollution Control Committee

MEMBER-SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :

1. The Director Industries Department, Pondicherry

2. The Commissioner

DSPP.—200/2—5,000 Cps. (G 6) 21-8-96.

GOVERNMENT OF PONDICHERRY

DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT

PONDICHERRY POLLUTION CONTROL COMMITTEE

3rd Floor, Housing Board Complex, Anna Nagar, Pondicherry-5
Phone: (0413)—34056.

(69)

WATER CONSENT ORDER (RENEWAL)

No.: PPCC/CON/CM/JE-II/99/1141 Pondicherry, the 3/5/99

To
M/s. Shasun Chemicals and Drugs Ltd
Kalapet
Pondicherry.

Consent is hereby ~~granted~~/renewed for discharge of effluent from M/s. Shasun Chemicals and Drugs Ltd, Kalapet under section 25 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and conditions,

1. Consent is valid upto : 31-1-2000.
2. Manufacturing Products : Ibuprofen - 100 TPM
3. The maximum daily water requirement/effluent dicharge shall not exceed the following (in KLD)

	Requirment	Discharge
(a) Domestic	5.0	5.0
(b) Industrial	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below:

Sl. No.	Parametres	Limits
1.	PH	6.5 - 8.5
2.	TSS	100 mg/lit
3.	BOD	100 "
4.	~~COD~~ Phenols as C6H5OH	5.0 "
5.	O&G	20 "
	Hexavalent Chromium	1.0 "
	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be recycled/discharged on land within the premises.

7. IMPLEMENTATION SCHEDULE:

As per Air Consent Order

8. Samples of treated industrial shall be collected at the terminal manhole once in a week/ fortnight/month/three months/six months/year. On any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed *vide* condition No. 5 stated above. Reports of analysis shall be submitted to this office regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS : 2480 as the case may be for domestic and industrial effluents.

9. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

10. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere whithin and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eucalyptus Subbabal or any suitable variety of trees) at the density of boundaries of the industry premises.

11. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

12. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

For on behalf of
Pondicherry Pollution Control Committee

MEMBER-SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to:

1. **The Director Industries Department, Pondicherry**
2. **The Commissioner** (ORG).

DSPP.—200/2—5,000 Cps. (G 6) 21-8-96.

GOVERNMENT OF PONDICHERRY

DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT

PONDICHERRY POLLUTION CONTROL COMMITTEE

3rd Floor, Housing Board Complex, Anna Nagar, Pondicherry-5
Phone: (0413)—34056.

(10)

WATER CONSENT ORDER (RENEWAL)

No.: PPCC/CON/ OM/JE.II/2001/ 591 Pondicherry, the 20.FEB 2001

To

M/s. Shasun Chemicals and Drugs Ltd.,
Kalapet, Pondicherry.

Consent is hereby ~~granted~~/renewed for discharge of effluent from M/s. Shasun Chemicals and Drugs Ltd., Kalapet under section 25 of the Water (Prevention and Control of Pollution) Act, 1974, subject to the following terms and conditions,

1. Consent is valid upto : 31-1-2002
2. Manufacturing Products : Ibuprofen - 100 TPM
3. The maximum daily water requirement/effluent dicharge shall not exceed the following (in KLD)

	Requirment	Discharge
(a) Domestic	5.0	5.0
(b) Industrial	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.
5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below:

Sl. No.	Parametres	Limits
1.	PH	6.5 - 8.5
2.	TSS	100 mg/lit
3.	BOD	100, "
4.	Phenols as C6H5OH	5.0 "
5. *	O&G	20 "

6. Industrial Effluent (After treatment wherever necessary) shall be ~~disposed~~/discharged ~~into the sea~~ 500 Mts. into sea.
7. IMPLEMENTATION SCHEDULE: As per consent order.

* Hexavalent Chromium 1.0 Mg/lit.
Total Chromium 2.0 "

8. Samples of treated industrial shall be collected at the terminal manhole once in a week/ fortnight/month/three months/six months/year. On any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed *vide* condition No. 5 stated above. Reports of analysis shall be submitted to this office regularly or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS: 2480 as the case may be for domestic and industrial effluents.

9. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

10. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere whithin and as well as Municipal treatment plants. In view of this, the applicant shall plant minimum three varieties (Eucalyptus Subbabal or any suitable variety of trees) at the density of boundaries of the industry premises.

11. Notwithstanding anything contained in this conditional letter of consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

12. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

For on behalf of
Pondicherry Pollution Control Committee

MEMBER-SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to:

1. The Director Industries Department, Pondicherry
2. The Commissioner / OM.

GOVERNMENT OF PONDICHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PONDICHERRY POLLUTION CONTROL COMMITTEE
3RD FLOOR, HOUSING BOARD COMPLEX, ANNA NAGAR, PONDICHERRY-5

* * *

(11)

WATER CONSENT ORDER (RENEWAL)

No. / PPCC / CON /WTR/OM/EE/2002/ 2877 Pondicherry, the - 5 SEP 2002

To
M/s. Shasun Chemicals and Drugs Ltd.,
Periyakalapet,
Pondicherry- 605 014.

Consent is hereby renewed for discharge of effluent from M/s. Shasun Chemicals and Drugs Ltd., Kalapet under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions.

1. Consent is valid upto : 31-01-2003

2. Manufacturing Products : Ibu Profen – 100 TPM
Ibu profen Dc -20 TPM
S. Naproxen – 20 TPM

3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5.0	5.0
(b) Industrial	:	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below.

Sl.No.	Parameters	Limits
1.	PH	6.5 – 8.5
2.	TSS	100 mg/l
3.	BOD	100 "
4.	Phenols as CSH5OH	5.0 "
5.	O & G	20 "
6.	Hexavalent Chromium	1.0 "
7.	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. Into sea.

7. IMPLEMENTATION SCHEDULE:

a) Date of everyday effluent characteristics shall be submitted once in a month

b) Submit the progress in achieving the goal of "Zero discharge" as per earlier consent order and your letter dated 21-03-2000

8. The applicant shall make an application for renewal of consent in the prescribed from at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere. In view of this, the applicant shall plant minimum three varieties at the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

11. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

For & on behalf of PPCC

(UDDIPTA RAY)
MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to:

1. The Director, Dte. of Industry and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

GOVERNMENT OF PONDICHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PONDICHERRY POLLUTION CONTROL COMMITTEE
3RD FLOOR, HOUSING BOARD COMPLEX, ANNA NAGAR, PONDICHERRY-5

* * *

(12)

WATER CONSENT ORDER (RENEWAL)

No. / PPCC / CON /WTR/OM/JE-II/2004/ 2045 Pondicherry, the 22 JUL 2004

To
M/s. Shasun Chemicals and Drugs Ltd.,
Periyakalapet,
Pondicherry- 605 014.

Consent is hereby renewed for discharge of effluent from M/s. Shasun Chemicals and Drugs Ltd., Kalapet under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions.

1. Consent is valid upto : 31-01-2005

2. Manufacturing Products : Ibu Profen – 100 TPM
Ibu profen Dc -20 TPM
S. Naproxen – 20 TPM

3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

	Requirement	Discharge
(a) Domestic	5.0	5.0
(b) Industrial	105	55

4. The domestic waste water shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below.

Sl.No.	Parameters	Limits
1.	PH	6.5 – 8.5
2.	TSS	100 mg/l
3.	BOD	100 "
4.	Phenols as CH_5OH	5.0 "
5.	O & G	20 "
6.	Hexavalent Chromium	1.0 "
7.	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea.

7. IMPLEMENTATION SCHEDULE:

a) Date of everyday effluent characteristics shall be submitted once in a month

b) Submit the progress in achieving the goal of "Zero discharge" as per earlier consent order and your letter dated 07-06-2004

c) The value of COD in treated effluent exceeds 250 ppm. You are therefore required to identify chemicals causing the same and report to this Authority within one month.

8. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere. In view of this, the applicant shall plant minimum three varieties at the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry, Pollution Control Committee reserves to it the right and power under section 27 (2) of the water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act, by the Pondicherry Pollution Control Committee.

11. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this department.

For & on behalf of PPCC

(Dr. P. DEVARAJ)
MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :

1. The Director, Dte. of Industry and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

GOVERNMENT OF PONDICHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PONDICHERRY POLLUTION CONTROL COMMITTEE
3RD FLOOR, HOUSING BOARD COMPLEX, ANNA NAGAR, PONDICHERRY-5

* * *

(13)

WATER CONSENT ORDER (RENEWAL)

No. / PPCC / CON /WTR/OM/JE-II/2004/ 3576 Pondicherry, the 5 DEC 2005

To
M/s. Shasun Chemicals and Drugs Ltd.,
Periyakalapet,
Pondicherry- 605 014.

Consent is hereby renewed for discharge of effluent from **M/s. Shasun Chemicals and Drugs Ltd., Kalapet** under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions.

1. Consent is valid upto : 31-01-2006

2. Manufacturing Products : Ibu Profen – 100 TPM
   Ibu profen Dc -20 TPM
   S. Naproxen – 20 TPM

3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5.0	5.0
(b) Industrial	:	105	55

4. The domestic wastewater shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below.

Sl.No.	Parameters	Limits
1.	PH	6.5 – 8.5
2.	TSS	100 mg/l
3.	BOD	100 "
4.	Phenols as CSH5OH	5.0 "
5.	O & G	20 "
6.	Hexavalent Chromium	1.0 "
7.	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea.

7. IMPLEMENTATION SCHEDULE:

   a) The unit shall submit monthly report on daily effluent characteristics.
   b) The unit shall submit quarterly report on the progress in achieving the goal of "Zero discharge". Zero discharge shall be achieved within one year time

8. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere. In view of this, the applicant shall plant minimum three varieties at the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry Pollution Control Committee reserves to it the right and power under section 27 (2) of the water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act.

11. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

For & on behalf of PPCC

P.T. Rudra Goud 02/12/05

(P.T. RUDRA GOUD)
MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :

1. The Director, Dte. of Industry and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

GOVERNMENT OF PONDICHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PONDICHERRY POLLUTION CONTROL COMMITTEE
3RD FLOOR, HOUSING BOARD COMPLEX, ANNA NAGAR, PONDICHERRY-5

* * *

WATER CONSENT ORDER (RENEWAL)

No. / PPCC / CON /WTR/OM/JE/2006/ 1690 Pondicherry, the - 5 JUL 2006

To

M/s. Shasun Chemicals and Drugs Ltd.,
Periyakalapet,
Pondicherry- 605 014.

Consent is hereby renewed for discharge of effluent from M/s. Shasun Chemicals and Drugs Ltd., Kalapet under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions.

1. Consent is valid upto : 31-01-2007

2. Manufacturing Products : Ibu Profen – 100 TPM
Ibu profen Dc -20 TPM
S. Naproxen – 20 TPM

3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5.0	5.0
(b) Industrial	:	105	55

4. The domestic wastewater shall be treated in a septic tank followed by soil absorption system.

5. The industrial effluent shall be treated before disposal so as to conform to the standards stated below.

Sl.No.	Parameters	Limits
1.	PH	6.5 – 8.5
2.	TSS	100 mg/l
3.	BOD	100 "
4.	Phenols as CSH5OH	5.0 "
5.	O & G	20 "
6.	Hexavalent Chromium	1.0 "
7.	Total Chromium	2.0 "

6. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea.

7. IMPLEMENTATION SCHEDULE:

a) The unit shall submit monthly report on daily effluent characteristics.
b) The unit shall submit quarterly report on the progress in achieving the goal of "Zero discharge". Zero discharge shall be achieved within December 2006 and monthly progress report shall be submitted in this regard from July 2006.
c) The ETP sludge shall be transferred to new solid waste pit after lining the pit with impermeable membrane, within a period of 3 months and monthly progress report shall be submitted in this regard from July 2006.

8. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

9. The role of trees in the removal of certain organic as well as inorganic toxicants is well known. Besides, the trees also play a very important role in purifying atmosphere. In view of this, the applicant shall plant minimum three varieties at the boundaries of the industry premises.

10. Notwithstanding anything contained in this conditional letter or consent, the Pondicherry Pollution Control Committee reserves to it the right and power under section 27 (2) of the water (Prevention and Control of Pollution) Act, 1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act.

11. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

For & on behalf of PPCC,

(M. ARUNACHALAM)
MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :

1. The Director, Dte. of Industries and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

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16

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT (TO OPERATE)

No. 9/PPCC/CON/WTR/OM/JE/2009/ 486 Puducherry, the 25 SEP 2009

To
M/s. Shasun Chemicals and Drugs Ltd.,
Periyakalapet,
Puducherry- 605 014.

Consent is hereby granted for discharge of sewage and/or trade effluent from **M/s. Shasun Chemicals and Drugs Ltd., Kalapet** under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended and rules and orders made there under subject to the following terms and conditions.

1. Consent is valid upto : 31.01.2011

2. Manufacturing Products : Ibuprofen - 340 TPM,
Ibu profen Dc -20 TPM
Ibu Derivatives (Ibuprofen Lysinate, S(+) Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 20 TPM
Pilot Scale Operations for R&D

3. i) Category : Red ii) Size : Large iii) Location : Mixed

4. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5	5
(b) Industrial	:	105	55

5. The domestic wastewater shall be treated in a septic tank followed by soil absorption system.

6. The industrial effluent shall be treated before disposal so as to conform to the Minimum National Standard stipulated in the Environmental Protection Rules, 1986 for Pharmaceutical Industry (Bulk Drugs) stated below:

Sl.No.	Parameters	Concentration not to exceed limits in mg/L (Except pH)
Compulsory		
1.	PH	6.5 – 8.5
2.	Oil & Grease	10
3.	BOD (3 days at 27 Deg. C)	100
4.	Total Suspended Solids	100 mg/l
5.	Bioassay Test	90 % Survival after 96 hours in 100% effluent
Additional		
1.	Mercury	0.01
2.	Arsenic	0.2
3.	Hexavalent Chromium	0.1
4.	Lead	0.1
5.	Cyanide	0.1
6.	Phenolics (C_6H_5OH)	1.0
7.	Sulfides (as S)	2.0
8.	Phosphate (as P)	5.0
9.	Total Chromium(as Cr)	2.0

7. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea at the existing Marine Outfall Point through properly designed diffuser system.

8. The unit shall install electro-magnetic flow meter for the bore wells and at the inlet and outlet of the effluent treatment plant and shall maintain records.

9. The unit shall dispose waste chromium sulphate to authorized buyers.

10. The unit shall recycle 30 – 40% of the effluent for industrial use by treating it in Reverse Osmosis plant.

11. The records of outsourcing of IBAB and Aldehyde shall be submitted every month with all related documents / receipts.

12. The unit shall submit a monthly report on the quantity and quality of the effluent discharged with reference to the effluent parameters stipulated in this consent.

13. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

14. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.

15. Notwithstanding anything contained in this conditional letter or consent, Puducherry Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act,1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act.

16. The above conditions may be modified or additional ones may be prescribed by this authority from time to time.

17. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

18. **Consent Validity & Report Submission:**

i) The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

ii) The unit shall submit an Environment Statement for the financial year ending 31st March in Form V prescribed under The Environment Protection Rules, 1986, on or before the 30th day of September every year.

/By order/

For & on behalf of PPCC,

(G. RAJAMOHAN)
MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :

1. The Director, Dte. of Industries and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

(16)

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT (TO OPERATE)

. 9/PPCC/CON/WTR/OM/JE/2011/ 404 Puducherry, the 31 MAR 2011

's. Shasun Chemicals and Drugs Ltd.,
iyakalapet,
ducherry- 605 014.

Consent is hereby renewed for discharge of sewage and/or trade effluent from M/s. Shasun emicals and Drugs Ltd., Kalapet under section 25/26 of the Water (Prevention and Control of llution) Act, 1974, as amended and rules and orders made there under subject to the following terms l conditions.

Consent is valid upto : 31.01.2012

Manufacturing Products : Ibuprofen - 340 TPM,
Ibu profen Dc -20 TPM –
Ibu Derivatives (Ibuprofen Lysinate, S(+) Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 20 TPM
Pilot Scale Operations for R&D

i) Category : Red ii) Size : Large iii) Location : Mixed

The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5	5
(b) Industrial	:	105	55

The domestic wastewater shall be treated in a septic tank followed by soil absorption system.

The industrial effluent shall be treated before disposal so as to conform to the Minimum tional Standard stipulated in the Environmental Protection Rules, 1986 for Pharmaceutical ndustry (Bulk Drugs) stated below:

Sl.No.	Parameters	Concentration not to exceed limits in mg/L (Except pH)
Compulsory		
1.	PH	6.5 – 8.5
2.	Oil & Grease	10
3.	BOD (3 days at 27 Deg. C)	100
4.	Total Suspended Solids	100 mg/l
5.	Bioassay Test	90 % Survival after 96 hours in 100% effluent
Additional		
1.	Mercury	0.01
2.	Arsenic	0.2
3.	Hexavalent Chromium	0.1
4.	Lead	0.1
5.	Cyanide	0.1
6.	Phenolics (C_6H_5OH)	1.0
7.	Sulfides (as S)	2.0
8.	Phosphate (as P)	5.0
9.	Total Chromium(as Cr)	2.0

Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea at the existing Marine Outfall Point through properly designed diffuser system.

8. The unit shall install electro-magnetic flow meter for the bore wells and at the inlet and outlet of the effluent treatment plant and shall maintain records.

9. The unit shall dispose waste chromium sulphate to authorized buyers.

10. The unit shall recycle 30 – 40% of the effluent for industrial use by treating it in Reverse Osmosis plant.

11. The records of outsourcing of IBAB and Aldehyde shall be submitted every month with all related documents / receipts.

12. The unit shall submit a monthly report on the quantity and quality of the effluent discharged with reference to the effluent parameters stipulated in this consent.

13. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

14. The applicant shall not undertake any expansion. modernization, diversification or change of location without prior clearance from this Committee.

15. Notwithstanding anything contained in this conditional letter or consent, Puducherry Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act,1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act.

16. The above conditions may be modified or additional ones may be prescribed by this authority from time to time.

17. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

18. <u>Consent Validity & Report Submission:</u>

i) The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

ii) The unit shall submit an Environment Statement for the financial year ending 31st March in Form V prescribed under The Environment Protection Rules, 1986, on or before the 30th day of September every year.

19. <u>Implementation Schedule:</u>

i) The unit shall carry out Bio Assay Test for the treated waste water disposed in to the sea and submit monthly report.
ii) The unit shall monitor the sea water quality around the marine outfall at least once in a season and submit report.

For & on behalf of PPCC,

MEMBER SECRETARY
PONDICHERRY POLLUTION CONTROL COMMITTEE

Copy to :
1. The Director, Dte. of Industries and Commerce, Pondicherry
2. The Commissioner, Oulgaret Municipality, Pondicherry.

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT (RENEWAL)

No. 9/PPCC/CON/WTR/OM/JE/2014/1003 Puducherry, the 14 NOV 2014

Consent is hereby renewed for discharge of sewage and/or trade effluent from **M/s. Shasun Pharmaceuticals Limited, Periyakalapet, Puducherry** under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended and rules and orders made there under subject to the following terms and conditions.

1. Consent is valid upto : 31.01.2016

2. Manufacturing Products : Ibuprofen - 340 TPM,
Ibu profen Dc -20 TPM
Ibu Derivatives (Ibuprofen Lysinate, S(+) Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 20 TPM
Pilot Scale Operations for R&D

3. i) Category : Red ii) Size : Large
iii) Location : Mixed iv) Area : 72843.71 sq.m

4. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD).

		Requirement	Discharge
(a) Domestic	:	5	5
(b) Industrial	:	105	55

5. The domestic wastewater shall be treated in a septic tank followed by soil absorption system.

6. The industrial effluent shall be treated before disposal so as to conform to the Minimum National Standard stipulated in the Environmental Protection Rules, 1986 for Pharmaceutical Industry (Bulk Drugs) stated below:

Sl.No.	Parameters	Concentration not to exceed limits in mg/L (Except pH)
Compulsory		
1.	PH	6.5 – 8.5
2.	Oil & Grease	10
3.	BOD (3 days at 27 Deg. C)	100
4.	Total Suspended Solids	100 mg/l
5.	Bioassay Test	90 % Survival after 96 hours in 100% effluent
Additional		
1.	Mercury	0.01
2.	Arsenic	0.2
3.	Hexavalent Chromium	0.1
4.	Lead	0.1
5.	Cyanide	0.1
6.	Phenolics (C_6H_5OH)	1.0
7.	Sulfides (as S)	2.0
8.	Phosphate (as P)	5.0
9.	Total Chromium(as Cr)	2.0

7. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea at the existing Marine Outfall Point through properly designed diffuser system

8. The unit shall install electro-magnetic flow meter for the bore wells and at the inlet and outlet of the effluent treatment plant and shall maintain records.

9. The unit shall dispose waste chromium sulphate to authorized buyers.

10. The unit shall recycle 30 – 40% of the effluent for industrial use by treating it in Reverse Osmosis plant.

11. The records of outsourcing of IBAB and Aldehyde shall be submitted every month with all related documents / receipts.

12. The unit shall submit a monthly report on the quantity and quality of the effluent discharged with reference to the effluent parameters stipulated in this consent.

13. The unit shall carry out Bio Assay Test for the treated waste water disposed in to the sea and submit monthly report.

14. The unit shall monitor the sea water quality around the marine outfall at least once in a season and submit report.

15. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or before "New or altered outlet" is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

16. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.

17. Notwithstanding anything contained in this conditional letter or consent, Puducherry Pollution Control Committee reserves to it the right and power under section 27 (2) of the Water (Prevention and Control of Pollution) Act,1974 to review any one or all the conditions imposed herein and to make such variations as deemed fit for the purpose of the Act.

18. The above conditions may be modified or additional ones may be prescribed by this authority from time to time.

19. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

20. **Consent Validity & Report Submission:**

i) The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

ii) The unit shall submit an Environment Statement for the financial year ending 31st March in Form V prescribed under The Environment Protection Rules, 1986, on or before the 30th day of September every year.

21. **Implementation Schedule:**

i) The performance of the ETP should be sustained through more careful operation and maintenance to consistently meet the regulatory standards. The dosage of chemicals shall be periodically optimized and the use of chemicals shall be monitored and records shall be maintained.

ii) The COD of the treated effluent shall be monitored during each shift and the treated effluent shall be pumped to the sea only if it is below 250 mg/L.
iii) The unit shall install online TOC measurement instrument at the ETP outlet in addition to the existing pH and TDS meter within 3 months.
iv) Continuous data logging system for all the monitoring instruments as well as the flow meter shall be provided and hardcopies of the records shall be maintained within 3 months.
v) Effluent sampling provision shall be provided in the marine discharge pipeline at the dispensary premises within 3 months.
vi) Treated effluent shall not be discharged into marine discharge pipeline during night time and pumping shall be done only during day time. Proper record of pumping shall be maintained and a monthly report for the same has to be submitted.
vii) Adequate safety and protection of the marine discharge pipeline shall be ensured by deputing adequate security guards, continuous patrolling, CCTV, etc.
viii) The unit shall install a new flow meter of the same make in the marine discharge pipeline at lower end (outlet) and calibrate/standardize the same to address the issue of difference in flow volumes recorded by the flowmeters at inlet and outlet points, within 3 months. The present Expert Committee along with PPCC may also study this issue and monitor the progress at regular intervals.
ix) The unit shall inform PPCC in advance about the Project details and Environmental Aspects of the Pilot scale Operations if any proposed to be carried out.

22. Conditions for better Environmental Management:

i) Effective measures shall be taken within the premises for conservation of rainwater. Roof top rain water harvesting arrangements shall be installed.

ii) Efficient and effective waste management practices to be ensured to reduce, reuse and recycle all types of Wastes.

iii) Adoption of Green Waste Management within the campus itself using appropriate technology / methods.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Shasun Pharmaceuticals Ltd.,
Periyakalapet,
Puducherry- 605 014.

Copy to :
1. The Director, Dte. of Industries and Commerce, Puducherry
2. The Commissioner, Oulgaret Municipality, Puducherry.

18(i)

21(i)

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III FLOOR, PHB BUILDING, ANNA NAGAR, PUDUCHERRY – 5.
Phone: (0413) 2201256, Fax: (0413) 2203494

* * *

AIR CONSENT ORDER (RENEWAL)

No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/ 1454

Dt. 1 FEB 2017
Puducherry, the

Consent is hereby renewed under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and orders made there under to M/s. Strides Shasun Limited Unit- I located at Periyakalapet, Oulgaret Municipality, Puducherry authorizing them to operate their plant in the Air Pollution Control area as notified subject to the conditions mentioned below:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent is valid upto : 31.1.2018

III. Manufacturing Products : Ibuprofen - 340 TPM,
Ibu profen Dc -20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 20 TPM,
Pilot Scale Operations for R&D.

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m

V. **Specific Conditions:**

1. The unit shall submit Bank Guarantee of Rs.50 lakhs valid for one more year till the validity of this consent order, within period of one week.

2. Performance of the Zero Liquid Discharge (ZLD) System installed shall be evaluated after commencement of operation.

3. The unit shall not carry out any excess production over and above the permitted capacity , as stated in the consent.

4. The Particulate Matter emission from the Biomass Briquettes Fired Boilers (Capacity of Boilers - 3.5 TPH x 1 No. and 4.5 TPH x 2 Nos.) shall be less than 800 mg/Nm3. To meet these standard, cyclone / multicyclone shall be installed with the boiler. The height of the chimney shall be above 20 meters.

5. a) The emissions arising from the IPCA reactor of the Ibuprofen plant shall be properly collected, controlled to the required standard and then discharged through chimney-III of 17.5 Mts. height from the ground level.

   b) The concentration of HCL. Mist and vapour in the emission shall not exceed 35 Mg./ Nm3. The scrubber provided for the control of emission shall be operated continuously with the process.

6. a) The emissions arising from the Ibuprofen drier shall be discharged through Chimney -IV of 17.5 mts. height from ground level.

   b) The concentration of PM in the above chimney shall not exceed 150 Mg./Nm3.

7. The emission from the Diesel Generator of capacity 1 X 250 KVA, 1 X 800 KVA and 1 X 1000 KVA shall comply with the noise and air emission norms stipulated in the Environment Protection Rules, 1986.
8. The Ambient Air Quality at the boundary of the industry shall not exceed the following standards:

PM_{10}	-	100 $\mu g/m^3$
$PM_{2.5}$	-	60 $\mu g/m^3$
SO_2	-	80 "
NO_X	-	80 "
CO	-	2000 "

9. The unit shall carry out Ambient Air Quality Monitoring as per the revised standards issued by CPCB vide Notification No. B-29016/20/90/PCI-I dated 18.11.2009 and submit monthly report.
10. The vents of solvents storage tanks shall be connected to activated carbon filter and the vents of storage tanks of Hydrochloric Acid and Acetyl Chloride and other chemical shall be provided with proper control equipment.
11. Noise generated during the process shall be mitigated by providing appropriate acoustic measures. The noise level at the boundary shall not exceed 65 and 55 dB (A) during day / night times respectively.
12. The unit shall ensure compliance of air emissions standards, the unit shall install continuous online monitoring system of all process stacks and boiler stacks and data's shall be continuously sent to CPCB/PPCC server.
13. Continuous VOC monitoring equipments in ambient air shall be installed and data's shall be continuously sent to CPCB/PPCC server.

14. **Implementation Schedule:**

i. The unit shall inform PPCC in advance about the project details and Environmental Aspects of the pilot scale operations proposed to be carried out.
ii. The unit shall carry out monitoring of VOC in the vent of equipments/condensers/all related equipments to ascertain the solvent loss and submit to PPCC within 2 months.
iii. The unit shall prepare a VOC reduction plan, implement it in time bound manner and shall submit report to PPCC.

VI. General Conditions:

1. The application for renewal of consent shall be made at least 30 days before the date of expiry of this consent order.
2. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.
3. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to cancel, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.
4. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this committee.

VII. **Report Submission:**

The unit shall submit an Environment Statement for the financial year ending 31st March in Form V prescribed under The Environment Protection Rules, 1986, on or before the 30th day of September every year.

VIII. **Better Environmental Management Practices:**

1. Green Belt / Thematic garden with woody plant / herbal plants shall be developed.
2. Energy conservation measures like installation of LED's for lighting the areas inside and outside the building should be integral part of the design.
3. Used CFL's and TFL's should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid toxic contamination.
4. Use of solar panels may be adapted to the maximum extent possible, especially for street lights.
5. 5% of power requirement of the unit shall be met out from renewable energy sources within period of three years as per PPA Building Bye-Laws vide G.O.Ms.No.5/2012 dt., 05.03.2012.
6. Energy audit & annual reduction to be planned and intimated to this office and furnish an annual report.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT ORDER (RENEWAL) 01 FEB 2017

No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/ 453 Puducherry, the

Consent is hereby renewed to ***M/s. Strides Shasun Limited Unit- I*** *located at Periyakalapet, Oulgaret Municipality, Puducherry, under the Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions:-*

I. Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.

II. Consent valid upto : 31.1.2018

III. Manufacturing Products : Ibuprofen - 340 TPM,
Ibu profen Dc -20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 20 TPM,
Pilot Scale Operations for R&D

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m.

V. **Specific Conditions:**

1. The unit shall submit fresh Bank Guarantee of Rs.50 lakhs valid for one more year till the validity of this consent order, within period of one week.

2. Performance of the Zero Liquid Discharge (ZLD) System installed shall be evaluated after commencement of operation.

3. The maximum daily water requirement/effluent discharge shall not exceed the following (in KLD)

		Requirement	Discharge
(a) Domestic	:	5	5
(b) Industrial	:	105	55

4. The domestic waste shall be treated in Sewage Treatment Plant and shall be disposed on land for gardening. The treated waste water shall comply with the 'General Standards for Discharge of Environmental Pollutants Part-A: Effluents' notified under Schedule VI of the Environment (Protection) Sixth Amendment Rules, 2009.

5. The industrial effluent shall be treated before disposal so as to conform to the Minimum National Standard stipulated in the Environmental Protection Rules, 1986 for Pharmaceutical Industry (Bulk Drugs) stated below:

Sl.No.	Parameters	Concentration not to exceed limits in mg/L (Except pH)
Compulsory		
1.	PH	6.5 – 8.5
2.	Oil & Grease	10
3.	BOD (3 days at 27 ^{0}C)	100

4.	Total Suspended Solids	100 mg/l
5.	Bioassay Test	90 % Survival after 96 hours in 100% effluent

Additional

1.	Mercury	0.01
2.	Arsenic	0.2
3.	Hexavalent Chromium	0.1
4.	Lead	0.1
5.	Cyanide	0.1
6.	Phenolics (C_6H_5OH)	1.0
7.	Sulfides (as S)	2.0
8.	Phosphate (as P)	5.0
9.	Total Chromium(as Cr)	2.0

6. Industrial Effluent (After treatment wherever necessary) shall be discharged 500 Mts. into sea at the existing Marine Outfall Point through properly designed diffuser system.

7. The unit shall install electro-magnetic flow meter for the bore wells and at the inlet and outlet of the effluent treatment plant and shall maintain records.

8. The unit shall dispose waste chromium sulphate to authorized buyers.

9. The unit shall recycle 30 – 40% of the effluent for industrial use by treating it in Reverse Osmosis plant.

10. The records of outsourcing of IBAP and Aldehyde shall be submitted every month with all related documents / receipts.

11. The unit shall submit a monthly report on the quantity and quality of the effluent discharged with reference to the effluent parameters stipulated in this consent.

12. The unit shall carry out Bio Assay Test for the treated waste water disposed in to the sea and submit monthly report.

13. The unit shall monitor the sea water quality around the marine outfall at least once in a season and submit report.

14. The performance of the ETP should be sustained through more careful operation and maintenance to consistently meet the regulatory standards. The dosage of chemicals shall be periodically optimized and the use of chemicals shall be monitored and records shall be maintained.

15. The COD of the treated effluent shall be monitored during each shift and the treated effluent shall be pumped to the sea only if it is below 250 mg/L.

16. The unit shall install online BOD/COD measurement instrument at the ETP outlet in addition to the existing pH and TDS meter and data's shall be continuously sent to CPCB/PPCC server.

17. Continuous data logging system for all the monitoring instruments as well as the flow meter shall be provided and hardcopies of the records shall be maintained.

18. Effluent sampling provision shall be provided in the marine discharge pipeline at the dispensary premises.

19. Treated effluent shall not be discharged into marine discharge pipeline during night time and pumping shall be done only during day time. Proper record of pumping shall be maintained and a monthly report for the same has to be submitted.

20. Adequate safety and protection of the marine discharge pipeline shall be ensured by deputing adequate security guards, continuous patrolling, CCTV, etc.

21. The unit shall install a new flow meter of the same make in the marine discharge pipeline at lower end (outlet) and calibrate/standardize the same to address the issue of difference in flow volumes recorded by the flow meters at inlet and outlet points.

22. The unit shall inform PPCC in advance about the Project details and Environmental Aspects of the Pilot scale Operations if any proposed to be carried out.

23. Implementation Schedule:

i. The unit shall carry out analysis of waste water in the effluent collection tanks of each process block for presence of organic chemicals/compounds which contribute to BOD/COD through Gas Chromatography/Liquid Chromatography or any suitable technique and submit report to PPCC within one month.

ii. The unit shall carry out feasibility study to decompose organic chemicals in effluent water for reduction of BOD/COD within 6 months.

iii. The unit shall fix individual flow meters in each of the effluent collection tanks outlet located in the process block and connect data to the ETP control room within 3 months and maintain proper record and submit monthly report data to PPCC.

VI. General Conditions:

1. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

2. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 27(2) of Water (Prevention and Control of Pollution) Act, 1974 to review any or all the conditions imposed herein and to revoke, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.

3. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

VII. Report Submission:

1. The unit shall submit an Environment Statement for the financial year ending 31st March in Form V prescribed under The Environment Protection Rules, 1986, on or before the 30th day of September every year.

2. The applicant shall measure and record the water consumption by fixing up water meter at such places as may be prescribed and shall furnish Water Cess Returns in Form – I on or before 5th of every calendar month under the provisions of Wafer (Prevention and Control of Pollution) Cess Rules, 1978.

VIII. Better Environmental Management Practices:

1. Appropriate Rain Water Harvesting Structures shall be established on scientific basis.

2. Efficient and effective waste management practices to be ensured to reduce, reuse and recycle all types of Wastes.

3. Adoption of Green Waste Management within the campus itself using appropriate technology / methods.

4. Fixtures for showers, toilet flushing and drinking water should be of low flow type and restricted to requirements by use of aerators, avoiding wastage by pressure reducing devices or sensor based controls.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

19 (i)
(2)(1)

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III FLOOR, PHB BUILDING, ANNA NAGAR, PUDUCHERRY – 5.
Phone: (0413) 2201256, Fax: (0413) 2203494

* * *

AIR CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/1655 Puducherry, the 23 MAR 2017

Consent is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and orders made there under to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry authorizing them to operate their plant in the Air Pollution Control area as notified subject to the conditions mentioned below:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent is valid upto : 31.1.2018

III. Manufacturing Products : Ibuprofen - 359 TPM,
Ibu profen Dc -20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D.
Total – 400 TPM

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m

V. **Specific Conditions:**

1. The change of product mix shall be maintained within the overall previously granted limits of 400 TPM and the unit shall not carry out any excess production.
2. There shall be no additional machineries installed.
3. There shall be no additional fresh water intake and no increase in pollution load.
4. All other conditions stipulated in Air consent order (Renewal) dated 01.02.2017 remains valid.

VI. **General Conditions:**

1. The application for renewal of consent shall be made at least 30 days before the date of expiry of this consent order.
2. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.
3. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to cancel, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.
4. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this committee.

19 (ii)

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

* * *

WATER CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/1656 Puducherry, the 23 MAR 2017

Consent is hereby granted for discharge of effluents to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry, under the Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent valid upto : 31.1.2018

III. Manufacturing Products : Ibuprofen - 359 TPM,
Ibu profen Dc -20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) - 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D
Total – 400 TPM.

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m.

V. **Specific Conditions:**

1. The change of product mix shall be maintained within the overall previously granted limits of 400 TPM and the unit shall not carry out any excess production.
2. There shall be no additional machineries installed.
3. There shall be no additional fresh water intake and no increase in pollution load.
4. All other conditions stipulated in Water consent order (Renewal) dated 01.02.2017 remains valid.

VI. **General Conditions:**

1. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.
2. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 27(2) of Water (Prevention and Control of Pollution) Act, 1974 to review any or all the conditions imposed herein and to revoke, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.
3. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

VII. **Better Environmental Management Practices:**

1. Appropriate Rain Water Harvesting Structures shall be established on scientific basis.
2. Efficient and effective waste management practices to be ensured to reduce, reuse and recycle all types of Wastes.
3. Adoption of Green Waste Management within the campus itself using appropriate technology / methods.
4. Fixtures for showers, toilet flushing and drinking water should be of low flow type and restricted to requirements by use of aerators, avoiding wastage by pressure reducing devices or sensor based controls.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

CTO-ZLD – AIR&Water 28/4/17

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29(1)

STRIDES SHASUN LIMITED Puducherry 605 014 PERIYAKALAPET

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III FLOOR, PHB BUILDING, ANNA NAGAR, PUDUCHERRY – 5.
Phone: (0413) 2201256, Fax: (0413) 2203494

* * *

AIR CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/AIR/OM-KAL/JE-II/2017/ 1699 Puducherry, the 31 MAR 2017

Consent is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and orders made there under to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry authorizing them to operate their **Zero Liquid Discharge plant with Multiple Effect Evaporator (250 KLD capacity) and new Briquette fired boiler (16 TPH capacity)** in the Air Pollution Control area as notified subject to the conditions mentioned below:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent is valid upto : 31.01.2018.

III. Manufacturing Products :
Ibuprofen – 359 TPM,
Ibu profen Dc – 20 TPM,
Ibu Derivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) – 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D.
Total – 400 TPM

IV. (i) Size : Large (iii) Location : Mixed
(ii) Category : Red (iv) Area : 72843.71 sq.m

V. **Specific Conditions:**

1. Flue Gas from 16 TPH briquette fired boiler shall be controlled with adequate air pollution control devices Bag filters/Multi cyclone arrangement and let out through stack height of 30 m height or higher than the surrounding building, whichever is higher.
2. PM emissions from the above boiler shall not exceed 150 mg/Nm^3.
3. The existing 3 numbers of boilers (Capacity - 3.5 TPH x 1 No. and 4.5 TPH x 2 Nos.) shall be operated on standby basis.
4. The unit shall have proper arrangements for monitoring and control of odour from Multiple Effect Evaporator and Agitated Thin Film Evaporator plant.
5. The new 1500 KVA DG Set proposed for power back up of Boiler & MEE operation shall be operated during power failure only and shall have Type Approval Certificate issued by Agencies authorized by Central Pollution Control Board. It shall meet the noise and air emission standards prescribed under The Environment (Protection) Rules, 1986 and shall be provided with integral acoustic enclosure.
6. All other conditions stipulated in Air consent order (Renewal) dated 01.02.2017 remains valid until the removal and dismantling of marine discharge pipelines.

VI. General Conditions:

1. application for renewal of consent shall be made at least 30 days before the date of expiry of this consent order.

2. The applicant shall not undertake any expansion, modernization, diversification or change of location without prior clearance from this Committee.

3. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to cancel, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.

4. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this committee.

VII. Better Environmental Management Practices:

1. Green Belt / Thematic garden with woody plant / herbal plants shall be developed.
2. Energy conservation measures like installation of LED's for lighting the areas inside and outside the building should be integral part of the design.
3. Used CFL's and TFL's should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/rules of the regulatory authority to avoid toxic contamination.
4. Use of solar panels may be adapted to the maximum extent possible, especially for street lights.
5. 5% of power requirement of the unit shall be met out from renewable energy sources within period of three years as per PPA Building Bye-Laws vide G.O.Ms.No.5/2012 dt., 05.03.2012.
6. Energy audit & annual reduction to be planned and intimated to this office and furnish an annual report.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE, TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
3rd Floor, Housing Board Complex, Anna Nagar, Puducherry - 5
Phone : (0413) 2201256 Fax : (0413) 2203494

STRIDES SHASUN LIMITED Puducherry 605 014 PERIYAKALAPET

* * *

WATER CONSENT ORDER (TO OPERATE)

No.7528/PPCC/CON/WTR/OM-KAL/JE-II/2017/ 1700 Puducherry, the 31 MAR 2017

Consent is hereby granted to **M/s. Strides Shasun Limited Unit- I** located at Periyakalapet, Oulgaret Municipality, Puducherry, to operate their **Zero Liquid Discharge plant with Multiple Effect Evaporator (250 KLD capacity) and new Briquette fired boiler (16 TPH capacity)** under the Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 subject to the following terms and conditions:-

I. **Notwithstanding anything contained in any other Act or Rules or Notifications, this Consent is given from pollution angle only.**

II. Consent valid upto : 31.01.2018.

III. Manufacturing Products :
Ibuprofen – 359 TPM,
Ibuprofen Dc – 20 TPM,
IbuDerivatives (Ibuprofen Lysinate, S(+),Ibuprofen & Ibuprofen Sodium) – 20 TPM,
Carisoprodol – 1 TPM,
Pilot Scale Operations for R&D
Total – 400 TPM.

IV. (i) Size : Large
(ii) Category : Red
(iii) Location : Mixed
(iv) Area : 72843.71 sq.m.

V. **Specific Conditions:**

1. The unit shall stop the marine discharge of treated effluent within the end of the validity of this consent order after stabilization of the Multiple Effect Evaporator (MEE) & Agitated Thin Film Drier (ATFD) and also completely dismantle and remove the marine discharge pipelines.

2. The fresh water requirement for process plant and associated utilities shall not exceed the existing consumption of 110 KLD.

3. The additional water required to the tune of 590 KLD for the MEE and new boiler shall be met from (a) the Treated Sewage Water to be procured from the PWD Sewage Treatment Plant at Karuvadikuppam and transported through trucks and (b) internal recovery& reuse of waste water.

4. In case of unavailability of treated sewage water from PWD Sewage Treatment Plant at Karuvadikuppam, the unit shall arrange treated waste water from other alternative sources, institutions like medical colleges for operation of MEE. The unit shall submit agreement in this regard to this authority within 2 months.

5. If the unit is not able to operate the ZLD / MEE plant for want of treated waste water or failure to dispose the MEE salt and ETP sludge, the unit shall stop production immediately under intimation to this authority.

6. The unit shall install sufficient number of water meters to measure the quantity of water consumed from different sources and for different purposes and shall maintain proper logbooks for water consumed.

7. Proper logbooks of MEE operation and also showing the quantity of effluent generated, fed to MEE, recycled / reused and discharged for gardening shall be maintained and furnished to the Puducherry Pollution Control Committee every month.

8. The unit shall provide flow meters to measure the inlet, recycled and evaporated water quantity in ZLD.

9. The unit shall provide separate energy meters for ZLD plant.

10. The unit shall continue to connect to Online monitoring system for bore well water flow meter reading to PPCC.

11. The unit shall strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste viz. Chemical Sludge from MEE, in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016. Authorization from the PPCC must be obtained for collection / treatment /storage /disposal of hazardous wastes.

12. The chemical sludge from MEE shall be stored in separate designated hazardous waste storage facility with impervious bottom and leachate collection facility, before its disposal.

13. The chemical sludge from MEE shall be disposed to the cement plant of M/s. Ultratech Cement Industry situated at Reddipalayam Cement Works, Ariyalur, Tamil Nadu for co-processing. The unit shall obtain NOC/intimate to TNPCB and PPCC before handing over the waste to the transporter.

14. If the unit intends to dispose the chemical sludge from MEE to any [Treatment, Storage and Disposal facility (TSDF) for hazardous waste] for land fill or other purposes, the unit shall obtain NOC from TNPCB and PPCC for transportation of Hazardous Waste.

15. The unit shall connect the effluent from M/s. Strides Shasun Unit – II to ZLD plant of M/s. Strides Shasun Unit – I.

16. All other conditions stipulated in Water consent order (Renewal) dated 01.02.2017 remains valid until the removal and dismantling of marine discharge pipelines.

VI. **Implementation Schedule:**

1. The unit shall provide list of flow meters with number, purpose and Calibration certificates of all flow meters shall be submitted to PPCC before commencement of operation.

2. The unit shall connect the flow meter reading of inlet, recycled and evaporated water quantity in ZLD to online monitoring system after full fledged operation of ZLD.

3. Separate pipeline for collection of leaching effluent from the ETP sludge and MEE salt storage shed has to be provided.

4. Pipe lines from existing Sewage treatment plant collection tank to be provided to ZLD plant.

5. All incoming line from process plant to collection tank and outgoing lines from collection tank to ZLD system shall be marked.

6. The unit shall intimate in writing to PPCC whenever the existing pipeline from process area to new ZLD is changed.

7. Internal pipeline from Collection tank to old ETP area shall be removed in presence of officials from PPCC and with prior intimation.

8. Water from Old ETP shall be drained and all inlet lines to old ETP shall be closed.

9. The unit shall submit evaluation report of ZLD with water consumption, water recycled, salt accumulated and power consumed after commencement of trail run and during full fledged operation.

VII. **General Conditions:**

1. The applicant shall make an application for renewal of consent in the prescribed form at least 30 days before the date of expiry of the consent or 30 days before the New or altered outlet is proposed to be commissioned and/or a new discharge is proposed to be made, whichever is earlier.

2. Notwithstanding anything contained in this consent, the Committee hereby reserves its right and power under Section 27(2) of Water (Prevention and Control of Pollution) Act, 1974 to review any or all the conditions imposed herein and to revoke, refuse, modify or stipulate additional conditions for the purpose of the Act by the Committee, if conditions of the consent granted are not fulfilled.

3. This consent order shall be exhibited in the office room and must be made available to the inspecting officers of this Committee.

VIII. **Better Environmental Management Practices:**

1. Appropriate Rain Water Harvesting Structures shall be established on scientific basis.

2. Efficient and effective waste management practices to be ensured to reduce, reuse and recycle all types of Wastes.

3. Adoption of Green Waste Management within the campus itself using appropriate technology / methods.

4. Fixtures for showers, toilet flushing and drinking water should be of low flow type and restricted to requirements by use of aerators, avoiding wastage by pressure reducing devices or sensor based controls.

For & on behalf of PPCC,

(M. DWARAKANATH)
MEMBER SECRETARY
PUDUCHERRY POLLUTION CONTROL COMMITTEE

To
M/s. Strides Shasun Limited Unit- I,
Periyakalapet, Oulgaret Municipality, Puducherry.

Copy to :-
1. The Director, Directorate of Industries & Commerce, Thattanchavady, Puducherry.
2. The Commissioner, Oulgaret Municipality, Puducherry.
3. The Licensing Authority, Drugs Control Department, Murungapakkam, Puducherry.
4. Standing Guard File.

No of Peaks		6	6	6	6	6

List of Raw Materials & Quantity for Existing and Proposed Products

Ibuprofen				
S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Acetone	14.04	12.17	26.21
2	Activated Carbon	2.51	2.18	4.69
3	Aldehyde	427.88	371.05	798.93
4	Ammonium Bi Carbonate	6.69	5.80	12.48
5	Caustic Soda Flakes	148.57	128.84	277.41
6	Caustic Soda Lye	53.49	46.38	99.87
7	Dilute Sulphuric Acid	427.88	371.05	798.93
8	Ferric Chloride	0.06	0.05	0.11
10	Hexane	75.95	65.86	141.82
11	Hydrochloric Acid	512.79	444.68	957.47
12	Hydroxyl Ammonium Sulphate	5.99	5.19	11.18
13	Iso butyl aceto phenone	408.36	354.11	762.47
14	Isopropyl Alcohol (IPA)	79.38	68.83	148.21
15	isopropyl chloro acetate	466.93	404.91	871.85
16	Liquor Ammonia	4.79	4.15	8.94
17	Methanol	5.00	5.00	10.00
18	Mono Chloro Acetate (MCA)	353.74	306.75	660.49
20	Sodium Bicarbonate	67.21	58.28	125.49
21	Sodium Chloride	2.48	2.15	4.62
22	Sodium Dichromate	260.74	226.11	486.85
23	Sodium Hydroxide, 48 %	480.09	416.32	896.42
24	Sodium Metal	84.90	73.62	158.52
25	Sulphuric Acid	132.41	114.82	247.23
Total		4,021.88	3,488.31	7,510.18

Ibuprofen DC				
S.no	Raw Material	Existing-	Proposed-TPM	Total after expansion-TPM

		TPM		
1	Ibuprofen	18.02	72.07	90.09
2	Starch	1.44	5.77	7.21
3	Cellulose	0.54	2.16	2.70
Total		20.00	80.00	100.00
Ibuprofen Lysine				
S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Ibuprofen	4.29	6.43	10.71
2	Isopropyl Alcohol (IPA)	5.69	8.54	14.23
3	DL. Lysine	5.73	8.59	14.31
Total		15.70	23.55	39.26
Ibuprofen Lysine				
S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Ibuprofen	4.29	6.43	10.71
2	Isopropyl Alcohol (IPA)	5.69	8.54	14.23
3	DL. Lysine	5.73	8.59	14.31
Total		15.70	23.55	39.26
Ibuprofen Sodium				
S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Ibuprofen	7.37	8.42	15.79
2	Toluene	3.26	3.73	6.99
3	Sodium Hydroxide	1.42	1.62	3.04
Total		12.05	13.77	25.82
S+ Ibuprofen				
S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Activated Carbon	0.05	0.06	0.11
2	Benzyl Cyanide	1.67	1.91	3.57
3	Benzyl Tri Ethyl Amm. Chloride	0.04	0.05	0.09
4	Biphenyl	0.09	0.10	0.19
5	Caustic Soda Flakes	1.80	2.06	3.86
6	Caustic Soda Lye	38.92	44.48	83.40
7	Hexane	3.55	4.05	7.60
8	Hydro Chloric Acid	33.45	38.23	71.69
9	Hydrogen Gas	0.10	0.11	0.21
10	Ibuprofen	9.33	10.67	20.00
11	Isopropyl Alcohol	25.34	28.96	54.31
13	Isopropyl Bromide	2.37	2.71	5.07
14	Liquid Ammonia	1.13	1.30	2.43
15	Methanol	16.01	18.29	34.30

16	Rane Nickel	0.50	0.58	1.08
19	S+Ibuprofen	1.44	1.65	3.09
20	Sodium Metal	0.04	0.05	0.09
22	Tetrhydra Furan	0.22	0.25	0.46
23	Toluene	25.40	29.03	54.44
Total		161.46	184.53	345.99

Carisoprodol

S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	2 - Methyl - 2 - Propyl - 1,3 - Propane diol	0.85	-	0.85
2	Activated Carbon	0.03	-	0.03
3	Anhydrous HCl gas	0.96	-	0.96
4	Dimethyl Carbonate	0.70	-	0.70
5	Hyflo	0.05	-	0.05
6	Isopropyl amine	1.04	-	1.04
7	Methanol	3.03	-	3.03
8	Sodium bicarbonate	0.46	-	0.46
9	Sodium Cyanate	0.40	-	0.40
10	Sodium Methoxide	0.01	-	0.01
11	Toluene	9.38	-	9.38
Total		16.92	-	16.92

Pregabalin

S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	3- (Carbamoylmethyl)-5-methylhexanoic acid	-	98.75	98.75
2	Activated Carbon	-	2.06	2.06
3	Caustic soda lye solution	-	64.72	64.72
4	Chloroform	-	65.72	65.72
5	Hydrochloride acid	-	122.31	122.31
6	D (+) - Phenylethylamine	-	28.75	28.75
7	Hyflo	-	3.09	3.09
8	Isopropyl alcohol	-	11.83	11.83
9	Methanol	-	36.50	36.50
10	Pregablin Stage I seeding material	-	0.06	0.06
11	p-Toluene sulphonic acid	-	1.38	1.38
12	Sodium Hypochlorite solution	-	100.54	100.54
13	Sodium Metabisulfite	-	0.07	0.07
14	Stage-1 and 2 ML material	-	1,030.00	1,030.00
15	Toluene	-	7.25	7.25
Total		-	1,573.03	1,573.03

Sapropritean di hydrochloride

S.no	Raw Material	Existing-TPM	Proposed-TPM	Total after expansion-TPM
1	Acetic acid	-	3.13	3.13
2	Acetic anhydride	-	27.00	27.00
3	Acetone	-	60.04	60.04
4	Acetonitrile	-	64.69	64.69
5	Activated carbon	-	2.79	2.79
6	Aqueous ammonia	-	12.50	12.50
7	Hydrchloric acid	-	85.76	85.76
8	Diisopropylether	-	335.42	335.42
9	DMAP	-	1.38	1.38
10	D-Ribose	-	20.83	20.83
11	Ethyl acetate	-	75.94	75.94
12	Hydrogen peroxide	-	12.50	12.50
13	Methanol	-	260.00	260.00
14	Methyl magnesium chloride	-	166.67	166.67
15	Phenyl hydrazine	-	16.52	16.52
16	Platinum IV oxide	-	0.08	0.08
17	Rectified spirit	-	41.60	41.60
18	Sodium bicarbonate	-	6.25	6.25
19	Sodium bicarbonate solution	-	31.25	31.25
20	Sodium carbonate	-	13.54	13.54
21	Sodium carbonate solution	-	25.00	25.00
22	Sodium dithionate	-	3.13	3.13
23	Sodium metaperiodate	-	25.42	25.42
24	TAP sulphate	-	11.25	11.25
25	Tetrahydrofuran	-	93.75	93.75
26	Toluene	-	88.54	88.54
27	Triethylamine	-	7.50	7.50
Total		-	1,492.45	1,492.45

NO. 4 / PPCC / NOC /JSA / 2017/ 209

GOVERNMENT OF PUDUCHERRY
PUDUCHERRY POLLUTION CONTROL COMMITTEE
III-Floor, Puducherry Housing Board Building, Puducherry - 605005.
Phone: (0413) 2201256 Fax: (0413) 2203494

* * *

To
M/s Strides Shasun Limited.,
R.S. No. 33,34
Mathur Road,
Periakalapet,
Puducherry – 605 014.

05 MAY 2017

Sub: PPCC - Grant of NOC to transport the Hazardous waste (Chemical Sludge) to Tamil Nadu Landfill site - Reg.
Ref: Yr.Lr. No.Nil, dated 23.11.2016.

* * *

Puducherry Pollution Control Committee has No Objection for transport of Chemical Sludge 400 TPM to TSDF located at Tamil Nadu Landfill site at Tamil Nadu as per rule 18 (3) of the Hazardous and Other waste (Management and Transboundary Movement) Rules, 2016, subject to compliance of various provisions of the Environment (Protection) Act, 1986 including the following conditions;

i) The validity of this permission for transportation of Hazardous waste from your unit is **for a period of One year** from the date of issue

ii) The unit shall obtain necessary clearance from Tamil Nadu State Pollution Control Board for interstate Movement of Hazardous waste, before transport of the waste.

iii) For transportation of proposed Hazardous waste for incineration, the provisions of Hazardous and Other wastes (Management and Transboundary Movement) Rules, 2016, and guidelines of Central Pollution Control Board shall be adhered to.

iv) The liability of the proper transportation & disposal of the Hazardous waste mentioned above lies with the generator. The generator shall ensure that the Hazardous waste is being transported and offloaded at the disposal site.

v) The unit shall submit manifest in Form-10 to this authority about each and every consignment of Hazardous wastes transported.

vi) Puducherry Pollution Control Committee reserves the right to review / impose additional conditions or revoke change or alter any of the terms and conditions.

vii) In case of any violation in the conditions stipulated, the permission can be withdrawn at any time and action as deemed fit shall be initiated.

viii) The unit shall dispose only authorized category and quantity of HW to M/s Tamil Nadu Waste Management Ltd., Tamil Nadu.

ix) The unit shall dispose only authorized category & quantity of HW to M/s Tamil Nadu Waste Management Ltd., Tamil Nadu.

For and on behalf of PPCC,

(M. DWARAKANATH)

SMSLA

SMS LABS SERVICES PRIVATE LIMITED

TEST REPORT

Report No : EN/17060150-08 **Report Date** : 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description	:	Stack Emission Monitoring			
Reference	:	Test Request Form Dated 28 Jun 2017			
Sample No	:	EN/17060150-08	**Sampling Date**	:	28 Jun 2017
Sampling Procedure	:	SMSLA/EN/SOP/111	**Sample Received on**	:	29 Jun 2017
Sampling Location	:	Boiler Stack	**Test Started on**	:	29 Jun 2017
Sample Condition	:	Fit for Analysis	**Test Completed on**	:	01 Jul 2017
Diameter of Stack	:	0.5m	**Ambient Temperature**	:	35°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Requirements as per CPCB
Chemical Test					
1	Stack temperature	By Digital Thermocouple	391	°K	-
2	Oxygen (O_2)	By Flue Gas Analyzer	17.8	%	-
3	Carbon Dioxide (CO_2)	By Flue Gas Analyzer	2.5	%	-
4	Carbon Monoxide (CO)	By Flue Gas Analyzer	394	ppm	-
5	Velocity of Gas	EPA Method 1-3	10.1	m/sec	-
6	Volume of Gas Discharged	IS 11255 Part-3 1985 (Reaff.2014)	5426	Nm3/Hr	-
7	Particulate Matter	IS 11255 Part 1 :1985 (Reaff:2014)	60.3	mg/Nm^3	*
8	Sulphur dioxide as SO_2	IS 11255 Part 2 :1985 (Reaff:2014)	43.2	mg/Nm^3	-
9	Nitrogen Oxides as NOX	By Flue Gas Analyzer	94.0	mg/Nm^3	-

***Note** : Less than 2 (Ton/Hour) :1200 mg/Nm3
2 to Less than 10 (Ton/Hour) : 800 mg/Nm3
10 to Less than 15 (Ton/Hour) : 600 mg/Nm3
15 and Above (Ton/Hour) :150 mg/Nm3

End of Report

Page 1 of 1

Authorised Signatory
Elakkiyathasan .K
Sr. Executive Chemist

39/6, Thiruvallur High Road, Puduchatram Post, Thirumazhisai Via, Poonamallee Taluk,
Chennai - 600 124. Phone : 044-26811662 - 664

Fire DG

SMSLA

SMS LABS SERVICES PRIVATE LIMITED

TEST REPORT

Report No : EN/17060150-09 **Report Date** : 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description : Stack Emission Monitoring

Reference : Test Request Form Dated 28 Jun 2017

Sample No : EN/17060150-09

Sampling Procedure : SMSLA/EN/SOP/111

Sampling Location : Fire Hydrant

Sample Condition : Fit for Analysis

Diameter of Stack : 0.1m

Sampling Date : 28 Jun 2017

Sample Received on : 29 Jun 2017

Test Started on : 29 Jun 2017

Test Completed on : 01 Jul 2017

Ambient Temperature : 34°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Requirements as per CPCB
Chemical Test					
1	Stack temperature	By Digital Thermocouple	646	°K	-
2	Oxygen (O_2)	By Flue Gas Analyzer	16.2	%	-
3	Carbon Dioxide (CO_2)	By Flue Gas Analyzer	4.1	%	-
4	Carbon Monoxide (CO)	By Flue Gas Analyzer	212	ppm	-
5	Velocity of Gas	EPA Method 1-3	19.0	m/sec	-
6	Volume of Gas Discharged	IS 11255 Part-3 1985 (Reaff.2014)	247	Nm3/Hr	-
7	Particulate Matter	IS 11255 Part 1 :1985 (Reaff:2014)	34.1	mg/Nm^3	150
8	Sulphur dioxide as SO_2	IS 11255 Part 2 :1985 (Reaff:2014)	32	mg/Nm^3	-
9	Nitrogen Oxides as NOX	By Flue Gas Analyzer	204	mg/Nm^3	-

End of Report

Authorised Signatory
Elakkiyathasan .K
Sr. Executive Chemist

39/6, Thiruvallur High Road, Puduchatram Post, Thirumazhisai Via, Poonamallee Taluk,
Chennai - 600 124. Phone : 044-26811662 - 664

D G

SMSLA

SMS LABS SERVICES PRIVATE LIMITED

TEST REPORT

Chemical T-2537
Biologist T-2538
Mechanical T-2539

Report No : EN/17060150-05 **Report Date** : 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description : Stack Emission Monitoring

Reference : Test Request Form Dated 28 Jun 2017

Sample No : EN/17060150-05

Sampling Procedure : SMSLA/EN/SOP/111

Sampling Location : 1500 KVA DG New

Sample Condition : Fit for Analysis

Diameter of Stack : 0.25m

Sampling Date : 28 Jun 2017

Sample Received on : 29 Jun 2017

Test Started on : 29 Jun 2017

Test Completed on : 01 Jul 2017

Ambient Temperature : 35°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Limit as per MoEF Specification
Chemical Test					
1	Stack Temperature	By Digital Thermocouple	535	°K	NA
2	Oxygen as O_2	By Flue Gas Analyzer	17.6	%	NA
3	Carbon Dioxide as CO_2	By Flue Gas Analyzer	2.1	%	NA
4	Carbon Monoxide as CO (at 15% O_2) mg/Nm^3	By Flue Gas Analyzer	123.8	mg/Nm^3	150
5	Velocity of the gas	IS 11255 Part 3: 1985 (Reaff.2014)	16.9	m/sec	NA
6	Volume of the gas discharged	IS 11255 Part 3: 1985 (Reaff.2014)	1659	Nm^3/hr	NA
7	Oxides of Nitrogen as NO_2 (at 15% O_2) on dry basis in ppmv	By Flue Gas Analyzer	555	ppmv	710
8	Particulate Matter (at 15% O_2) (Diesel fuels HSD&LDO) mg/Nm^3	IS 11255 Part 1:1985 (Reaff.2014)	59.9	mg/Nm^3	75
9	Sulphur Dioxide as SO_2	IS 11255 Part 2:1985 (Reaff.2014)	32	mg/Nm^3	NA

Remarks: The Ministry of Environmental and forest, Government of India (G.S.R. 489 (E), 9th July 2002).
Note : NA: Not Applicable

End of Report

Page 1 of 1

Authorised Signatory
Elakkiyathasan .K
Sr. Executive Chemist

39/6, Thiruvallur High Road, Puduchatram Post, Thirumazhisai Via, Poonamallee Taluk, Chennai - 600 124. Phone : 044-26811662 - 664

DG

SMS LABS SERVICES PRIVATE LIMITED

SMSLA

TEST REPORT

Report No : EN/17060150-07 **Report Date** : 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description : Stack Emission Monitoring

Reference : Test Request Form Dated 28 Jun 2017

Sample No : EN/17060150-07

Sampling Procedure : SMSLA/EN/SOP/111

Sampling Location : 1000 KVA DG New

Sample Condition : Fit for Analysis

Diameter of Stack : 0.25m

Sampling Date : 28 Jun 2017

Sample Received on : 29 Jun 2017

Test Started on : 29 Jun 2017

Test Completed on : 01 Jul 2017

Ambient Temperature : 38°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Limit as per MoEF Specification
Chemical Test					
1	Stack temperature	By Digital Thermocouple	461	°K	-
2	Oxygen (O_2)	By Flue Gas Analyzer	17.2	%	-
3	Carbon Dioxide (CO_2)	By Flue Gas Analyzer	2.2	%	-
4	Carbon Monoxide (CO)	By Flue Gas Analyzer	0.76	g/kw-hr	≤ 3.5
5	Velocity of Gas	EPA Method 1-3	12.7	m/sec	-
6	Volume of Gas Discharged	IS 11255 Part - 3 1985 (Reaff.2014)	1447	Nm3/Hr	-
7	Particulate Matter	IS 11255 Part 1 :1985 (Reaff:2014)	0.086	g/kw-hr	≤ 0.2
8	Sulphur dioxide as SO_2	IS 11255 Part 2 :1985 (Reaff:2014)	32	mg/Nm^3	-
9	Nitrogen Oxides as NOx	IS 11255 Part 3:2008 (Reaff.2014)	0.67	g/kw-hr	**
10	Total Hydrocarbons as C*	USEPA Method 25A	BDL(DL:0.1mg/m3)	-	**

Remarks: The Ministry of Environmental and forest, Government of India (G.S.R. 771 (E), 1st April 2014).*Non NABL.

Note : **NOx + HC - ≤ 4.0 g/kw-hr. BDL: Below Detection Limit.

End of Report

Page 1 of 1

Authorised Signatory

Elakkiyathasan .K

Sr. Executive Chemist

39/6, Thiruvallur High Road, Puduchatram Post, Thirumazhisai Via, Poonamallee Taluk, Chennai - 600 124. Phone : 044-26811662 - 664

DG1

SMS LABS SERVICES PRIVATE LIMITED

SMSLA

TEST REPORT

Report No : EN/17060150-06 Report Date : 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description	:	Stack Emission Monitoring			
Reference	:	Test Request Form Dated 28 Jun 2017			
Sample No	:	EN/17060150-06	**Sampling Date**	:	28 Jun 2017
Sampling Procedure	:	SMSLA/EN/SOP/111	**Sample Received on**	:	29 Jun 2017
Sampling Location	:	1000 KVA DG Old	**Test Started on**	:	29 Jun 2017
Sample Condition	:	Fit for Analysis	**Test Completed on**	:	01 Jul 2017
Diameter of Stack	:	0.25m	**Ambient Temperature**	:	38°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Limit as per MoEF Specification
Chemical Test					
1	Stack temperature	By Digital Thermocouple	459	°K	-
2	Oxygen (O_2)	By Flue Gas Analyzer	17.5	%	-
3	Carbon Dioxide (CO_2)	By Flue Gas Analyzer	2.1	%	-
4	Carbon Monoxide (CO)	By Flue Gas Analyzer	0.72	g/kw-hr	≤ 3.5
5	Velocity of Gas	EPA Method 1-3	11.7	m/sec	-
6	Volume of Gas Discharged	IS 11255 Part - 3 1985 (Reaff.2014)	1339	Nm3/Hr	-
7	Particulate Matter	IS 11255 Part 1 :1985 (Reaff:2014)	0.094	g/kw-hr	≤ 0.2
8	Sulphur dioxide as SO_2	IS 11255 Part 2 :1985 (Reaff:2014)	29.3	mg/Nm^3	-
9	Nitrogen Oxides as NOx	IS 11255 Part 3:2008 (Reaff.2014)	0.61	g/kw-hr	**
10	Total Hydrocarbons as C*	USEPA Method 25A	BDL(DL 0.1mg/m3)	-	**

Remarks: The Ministry of Environmental and forest, Government of India (G.S.R. 771 (E), 1st April 2014).*Non NABL.
Note : **NOx + HC - ≤ 4.0 g/kw-hr. BDL: Below Detection Limit.

End of Report
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Authorised Signatory

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SMS LABS SERVICES PRIVATE LIMITED

SMSLA

TEST REPORT

Report No : EN/17060150-04 **Report Date :** 01 Jul 2017

SAMPLE DRAWN BY LABORATORY

Customer Name : M/S. STRIDES SHASUN PHARMACEUTICALS PVT LTD,

Customer Address : Unit I, Shasun Road, API, Periyakalapet, Pondicherry - 605 014.

Sample Description : Stack Emission Monitoring

Reference : Test Request Form Dated 28 Jun 2017

Sample No : EN/17060150-04

Sampling Procedure : SMSLA/EN/SOP/111

Sampling Location : 1500 KVA DG Old

Sample Condition : Fit for Analysis

Diameter of Stack : 0.25 m

Sampling Date : 28 Jun 2017

Sample Received on : 29 Jun 2017

Test Started on : 29 Jun 2017

Test Completed on : 01 Jul 2017

Ambient Temperature : 36°C

Test Results

Sl.No	Parameter	Test Method	Results	Unit	Limit as per MoEF Specification
Chemical Test					
1	Stack Temperature	By Digital Thermocouple	529	°K	NA
2	Oxygen as O_2	By Flue Gas Analyzer	17.1	%	NA
3	Carbon Dioxide as CO_2	By Flue Gas Analyzer	2.4	%	NA
4	Carbon Monoxide as CO (at 15% O_2) mg/Nm^3	By Flue Gas Analyzer	132.2	mg/Nm^3	150
5	Velocity of the gas	IS 11255 Part 3: 1985 (Reaff.2014)	16.4	m/sec	NA
6	Volume of the gas discharged	IS 11255 Part 3: 1985 (Reaff.2014)	1628	Nm^3/hr	NA
7	Oxides of Nitrogen as NO_2 (at 15% O_2) on dry basis in ppmv	By Flue Gas Analyzer	545	ppmv	710
8	Particulate Matter (at 15% O_2) (Diesel fuels HSD&LDO) mg/Nm^3	IS 11255 Part 1:1985 (Reaff.2014)	58.9	mg/Nm^3	75
9	Sulphur Dioxide as SO_2	IS 11255 Part 2:1985 (Reaff.2014)	26.5	mg/Nm^3	NA

Remarks: The Ministry of Environmental and forest, Government of India (G.S.R. 489 (E), 9th July 2002).

Note : NA: Not Applicable

End of Report

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