

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

FINAL EIA REPORT

- 1. ENVIRONMENTAL IMPACT ASSESSMENT**
- 2. ENVIRONMENT MANAGEMENT PLAN**
- 3. PUBLIC CONSULTATION**
- 4. COMPLIANCE OF TERMS OF REFERENCE**
- 5. ANNEXURES**

**Project No. 0118-13-03
January 2018**

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**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**

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62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

1. ENVIRONMENTAL IMPACT ASSESSMENT REPORT

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1.0 INTRODUCTION

1.0 Introduction of the Project *(Terms of Reference No. 2(ii) & 2(iii))*

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) a group company of TGV group; has established a Caustic soda manufacturing unit at Gondiparla village, Kurnool mandal in Kurnool district, Andhra Pradesh. TGV group established Caustic soda plant in 1987 and expanded in various phases during the last 20 years by adopting most modern, energy saving, environment friendly membrane process technology. The unit obtained ISO 9001, ISO 14001 and OSHAS 18001 certifications.

M/s. SRAAC obtained latest Environment Clearance Vide file no. F. No. J-11011/619/2009-IA.II (I), dt. 14.02.2012. It is proposed to expand the manufacturing capacity of Chlor-Alkali, Chloromethanes and inclusion of Chlorodifluoromethane plant in the existing area of 152.4 ha. The capital cost for expansion is Rs. 360 crores, towards enhancement of effluent treatment plant, production facility, pollution control equipment and additional equipment to enhance the capacity. Prior environmental clearance is mandated by Ministry of Environment and Forests, vide SO 1533, dated September 14, 2006, for chlor-alkali industry and synthetic organic chemicals manufacturing activity. The terms of reference for the environmental impact assessment studies was obtained from MoEF&CC vide letter no. F.No. J-11011/84/2016-IA II (I) dated 21.06.2016 2016 and the Public Hearing was conducted on 29.11.2017 as part of environmental clearance process. The certified compliance letter from the regional office of MoEFCC, Chennai is obtained vide letter no. 29.09.2016/1927 dated 29.09.2016.

M/s. SRAACL is conscious of its responsibility towards the society in minimizing the pollution load due to the proposed expansion and accordingly decided to carry out the Environmental Impact Assessment to identify the negative and positive impacts and to delineate effective measures to control the pollution and to mitigate the environmental pollution. M/s. SRAACL has appointed Team Labs and Consultants for the preparation of Environmental Impact Assessment report.

Immediately after the receipt of the work order for the preparation of EIA report, the collection of primary (field data) and secondary (data available with various state and central government agencies) data has begun. Reconnaissance survey of the region was carried out during of November 2016, and various sampling locations to monitor environmental parameters have been identified. Subsequently, monitoring has commenced for collection of data on meteorology, ambient air quality, surface and ground water quality, soil characteristics, noise levels flora and fauna at the specified locations during December 2016 – February 2017. The other studies such as socio-economic profile, land use pattern etc are based on secondary data collected from various Government agencies and validated through the primary surveys. The Ambient air monitoring locations have been selected based on the initial Air dispersion Modeling carried out by using the meteorological data generated at India Meteorological Department (IMD).

Field team of M/s. Team Labs and Consultants worked in the study area during December 2016 – February 2017 and base line data for various environmental components i.e., air, water, soil, noise and flora and fauna and socio economic status of people was collected in a circular area of 10 km radius by taking the industry site as the center point, to assess the existing environmental status as per the guidelines specified by Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. This report presents the results of environmental impact assessment study along with the environmental management plan, necessary to avoid or mitigate the observed environmental impacts of the proposed expansion.

1.1 Product Profile *(Terms of Reference No. 3(ii) & (iii))*

The manufacturing capacity of permitted, proposed and after expansion products are presented in **Table 1.1**.

Table 1.1 Manufacturing Capacity

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	--	50
7	Sodium Sulphate	TPD	--	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride*	TPD	7.6	7.6	15.2
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	--	10	10
2	Hydrochloric Acid (100 %)	TPD	--	8.27	8.27
IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	--	76
2	Power generation Furnace Oil**	MW	31	--	31
V. Oil and Fatty Acid Division					
1	Oil and Fatty Acid Products (Non EC Products)	TPD	498	--	498

*Carbon Tetrachloride (CCl₄) generated will be sold as a feed stock to Authorized users/excess will be incinerated.

** Shall be kept as standby.

1.2 Technology

The manufacturing technology chosen for chlor-alkali plant is membrane technology which is environment friendly. The by-products are hydrogen, chlorine and sodium hypo chloride. Hydrochloric acid is manufactured using H₂ and Cl₂ produced from cell house.

Chloromethanes (CMS) is manufactures by hydro chlorination of methanol in vapor phase in presence of catalyst followed by thermal chlorination of methyl chloride in vapor phase with chlorine and rectification, azeotrope separation and dehydration of the mixed products.

Chlorodifluoromethane (R22) is produced by reacting chloroform with hydrogen fluoride. This reaction involves generation of HCl as by product. The refrigerant R22 along with HCl will evolve from the reactor in gaseous form. This is to be cooled and HCl absorbed in Hydrochloric acid absorption system, to produce 28 to 30% HCl.

1.3 Plant Location & Layout

The plant site is located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The site is located at the intersection of 15° 49' 30" (N) latitude and 78° 4' 30" (E) longitude. The site elevation above mean sea level (MSL) is 300 m. The plant site is surrounded by open lands in east direction, Sree Rayalaseema Hi-Strength Hypo Limited (SRHHL) in north direction, Road connecting the NH-7 with Gondiparla village in the south and west directions. The nearest habitation from the plant is E.Tandrapadu village located at a distance of 0.5 km in northwest direction. The main approach road is NH-7 - Gondiparla village adjacent to the site in northwest direction. The nearest Town and Railway station is Kurnool at a distance of 3.5 km in northwest direction and nearest airport is Shamshabad located at a distance of 165 km in northeast direction. Tungabhadra River is flowing from northwest to southeast direction at a distance of 1.5 km in south direction. Interstate boundary between Telangana and Andhra Pradesh is at a distance of 1.3 km in northeast direction. There are two reserve forests in the study area. Gadidmadugu RF at a distance of 5.5 km in east direction. Pullaiah RF at a distance of 9.3 km in southwest direction. There are no National Parks, sanctuaries and critically polluted area within the impact area of 10 km surrounding the site. The location map and site layout is as shown in [Fig 1.1](#) and [Fig 1.2](#).

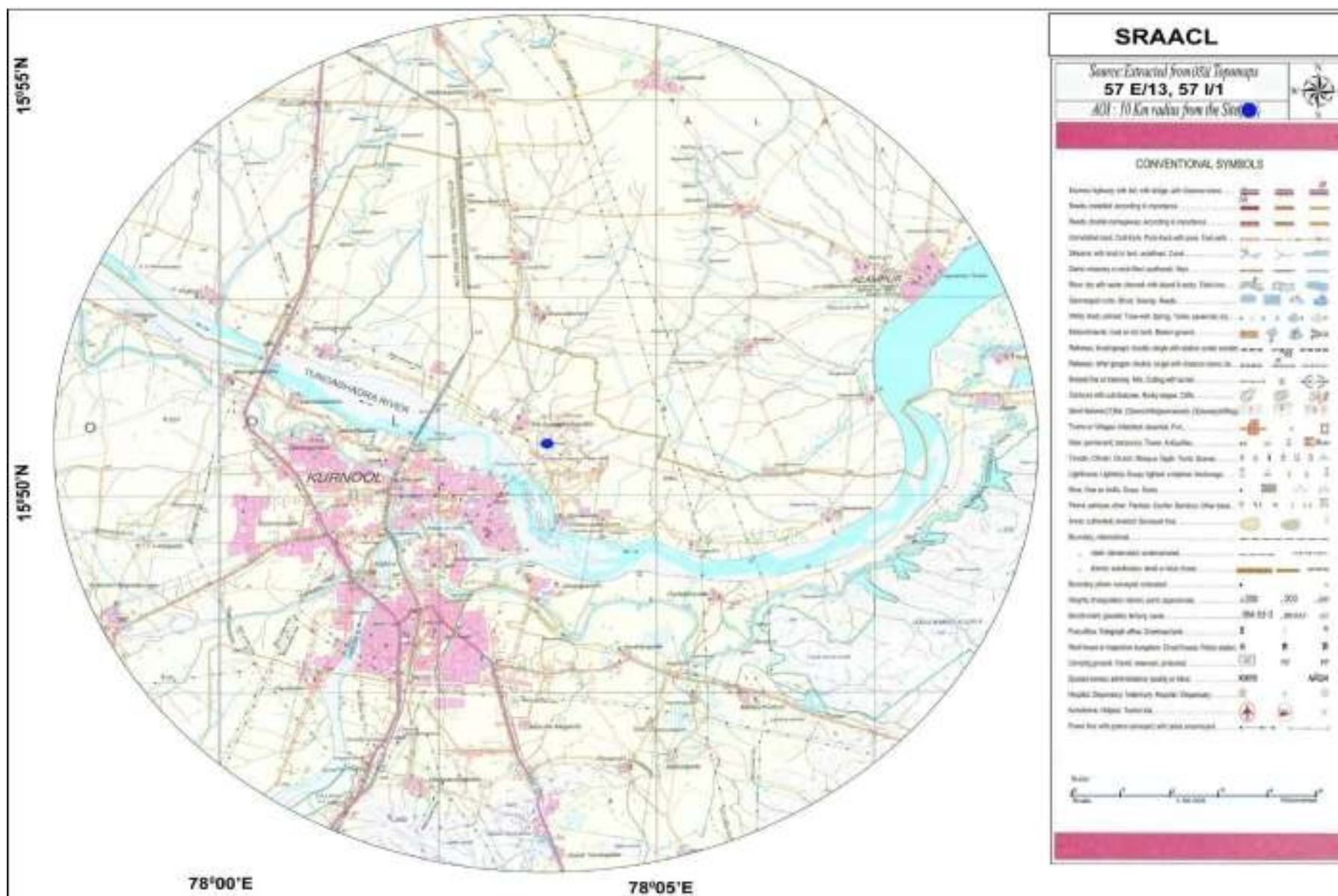


Fig 1.1 Location of M/s. SRAACL (Terms of Reference No. 4(ii))

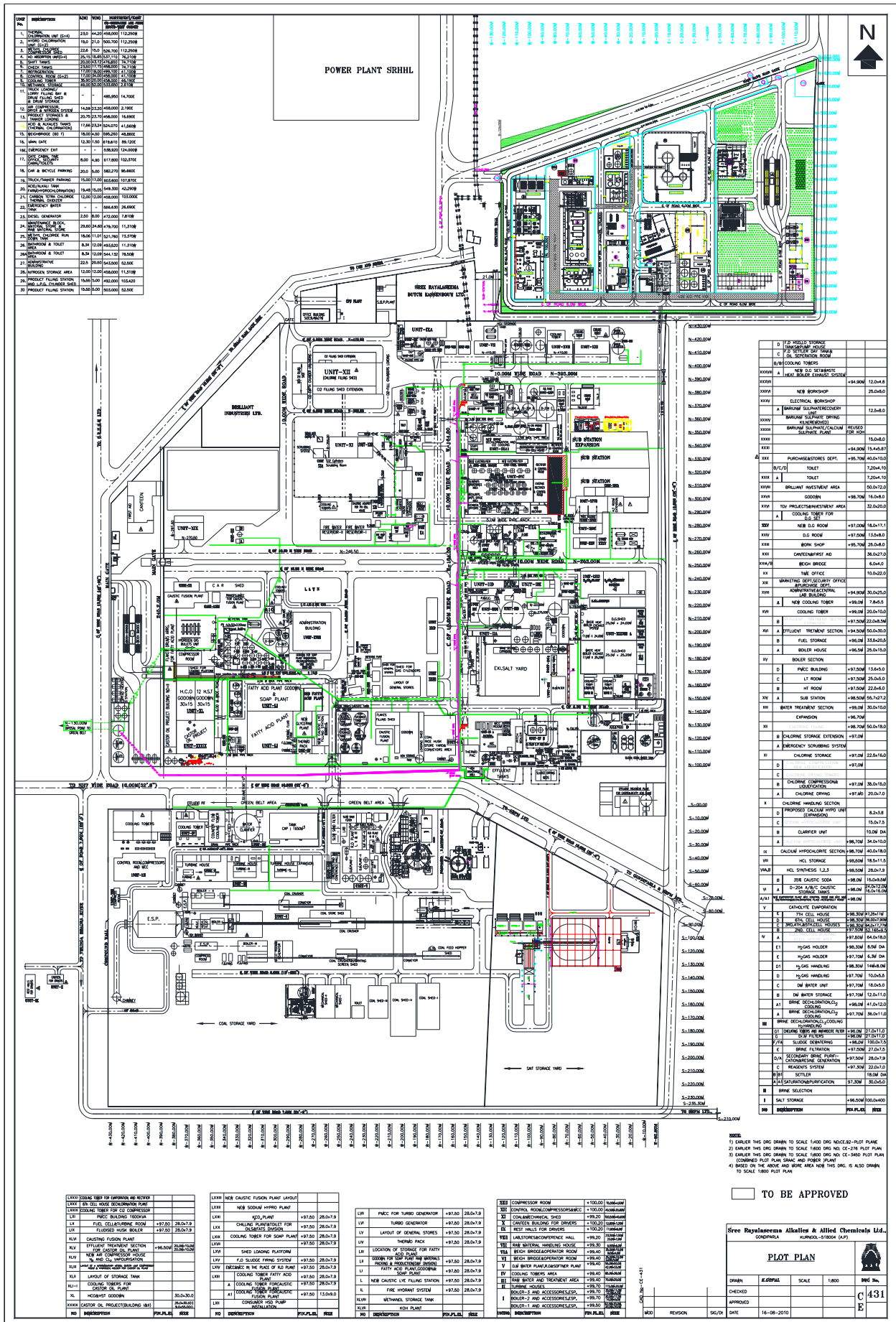


Fig 1.2 Plant Layout of M/s. SRAACL (Terms of Reference No. 4(vi),4(viii))

1.4 Scope of EIA Studies

EIA study involves three basic components, viz. identification, prediction and evaluation of impacts. The brief scope of EIA study incorporating the terms of reference (TOR) obtained from MoEFCC is as follows:

- An intensive reconnaissance and preliminary collection of environmental information to plan field study.
- Field studies to collect preliminary information, particularly on the quality of the physical environment. Experienced scientists and engineers will collect the data.
- Base line data generation and characterization of air, water, soil, noise and vegetation in the ten kilometer radius area (impact zone) over a period of Three months.
- A thorough study of the process including provisions for pollution control, and environmental management that includes prediction of impacts and relevant mathematical modeling.
- Preparation of Environmental Monitoring Program.
- Preparation of Environmental Management Plan suggesting suitable methods for mitigating and controlling the pollution levels. Environmental Monitoring Plan is suggested for monitoring the pollution loads at various facilities in the premises and to ensure compliance with the statutory requirements.

CHAPTER 2.0 PROCESS DESCRIPTION AND POLLUTION CONTROL FACILITIES**2.0 Introduction**

Sree Rayalaseema Alkalies and Allied Chemicals Limited located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh obtained consent and authorization (CFO) vide Letter No. APPCB/KNL/KNL/16332/CFO&HWA/HO/2014-6628 dated 04.03.2016 and APPCB/KNL/KNL/16332/CFO&HWA/HO/2015 dated 06.06.2016. It is proposed to expand the manufacturing capacity of Chlor-Alkali, Chloro methanes and inclusion of Chlorodifluoromethane plant. The manufacturing capacity is presented in [Table 2.1](#).

Table 2.1 Proposed Manufacturing Capacity

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	--	50
7	Sodium Sulphate	TPD	--	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride*	TPD	7.6	7.6	15.2
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	--	10	10
2	Hydrochloric Acid (100 %)	TPD	--	8.27	8.27
IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	--	76
2	Power generation Furnace Oil**	MW	31	--	31
V. Oil and Fatty Acid Division					
1	Oil and Fatty Acid Products (Non EC Products)	TPD	498	--	498

*Carbon Tetrachloride (CCl₄) generated will be sold as a feed stock to Authorized users/excess will be incinerated.

** Shall be kept as standby.

2.1 Process description *(Terms of Reference No. 3(vii))*

2.1.1 Process Description of Caustic Soda

The manufacturing process for caustic soda is by electrolytic process using Membrane Cell Technology. Raw material is common salt. The process consists of the following sections

- i. Brine dechlorination, saturation and purification
- ii. Electrolysis of brine
- iii. Chlorine handling
- iv. Hydrogen Handling
- v. Hydrochloric gas synthesis
- vi. Caustic Evaporation and flaking
- vii. Chlorine neutralization

Each step is briefly discussed below

i. Brine Dechlorination, Saturation and Purification

Depleted brine (salt solution) after electrolysis is dechlorinated in dechlorination unit by addition of hydrochloric acid and residual chlorine is eliminated by vacuum dechlorination followed by sodium sulphite addition.

After neutralization with caustic soda the depleted brine is resaturated in saturator by adding raw salt. During saturation brine picks up impurities available in salt i.e., calcium, magnesium and sulphate.

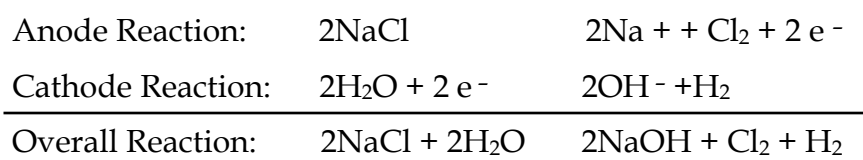
All the impurities are treated in reactors by addition of sodium carbonate for calcium removal, sodium hydroxide for magnesium removal and barium chloride or barium carbonate for sulfate removal.

The treated brine with suspended solids of calcium carbonate and magnesium hydroxide enter into the settler. From the settler bottom the solid material is removed by vacuum drum filter as brine sludge. Sulphates are recovered selectively in Barium Sulphate plant as Barium Sulphates.

Over flow brine is filtered, passed through ion-exchange column to purify further and stored in MSRL tanks to feed to electrolyses as electrolyte.

ii. Electrolysis of Brine

The purified brine is fed to bi-polar "Ion Exchange membrane" electrolyzers, to undergo electrolysis by application of D.C. power. Part of the brine undergoes electrolysis liberating Sodium ions and Chloride ions. Chlorine ion moving to anode zone comes out as chlorine gas along with depleted brine to the separator and gets separated. Sodium ions pass through ion exchange membrane to cathode compartment to react with demineralised water to form Sodium Hydroxide and Hydrogen gas. Both Sodium Hydroxide and Hydrogen gas enter into separator and Hydrogen gas gets separated. The caustic soda produced in electrolysis is about 32% conc. and it is enriched in Evaporation Unit to 48% by circulation of steam.



iii. Chlorine Handling

Wet and Hot Chlorine Gas liberated from electrolysis is cooled in Heat Exchanger and blown to utilities point through a mist eliminator. About 70% of the gas is fed to drying tower to dry the gas by circulation of Sulphuric Acid.

Dried gas is compressed and liquefied in liquefier by circulation of freon gas and stored in chlorine storage vessels. Unliquefied lean chlorine gas is diverted to HCl Plant.

iv. Hydrogen Handling

Hydrogen gas is separated from catholyte separator, and is cooled after washing with demineralised water and blown to utilities point i.e., Boiler, Hydrochloric Acid, synthesis unit, Gas holder of Oil and Fats Division and to downstream unit to bottle.

v. Hydrogen chloride gas Synthesis

Both Hydrogen and Chlorine gases are burnt in equal proportion in Hydrochloric Acid synthesis unit in graphite chamber to produce hydrogen chloride gas. The gas is cooled and absorbed in demineralised water to get 32% HCl Acid. Part of the HCl gas is also supplied to sister concern M/s Sri Rayalaseema High Strength Hypo Ltd., to manufacture Chlorosulphonic acid.

vi. Caustic Evaporation and Flaking

32% Caustic Soda Lye produced in electrolysis is fed to triple effect Caustic Evaporation Unit wherein steam is supplied to enrich the concentration up to 48% in this stage. All the steam and process condensate are sent back for recirculation. Part of the 48% caustic soda lye is fed to caustic flaking unit to drive out all water by circulation of molten salt to enrich the concentration to about 99%. The molten caustic is fed to flaker, cooled and to bagged the product as flakes.

vii. Chlorine Neutralization

To ensure clean environment all residual chlorine gases from various sections i.e., from chlorine bottling, chlorine storage, etc., are sucked by chlorine blower through a caustic soda scrubber to scrub the chlorine to neutralize it as sodium hypo chlorite. Residual gases from the scrubber are passed through secondary scrubber to ensure 100% absorption. The product is sold as sodium hypo chlorite. Schematic diagram of caustic soda manufacturing process is presented in [Fig 2.1](#) and mass balance is presented in [Table 2.2](#)

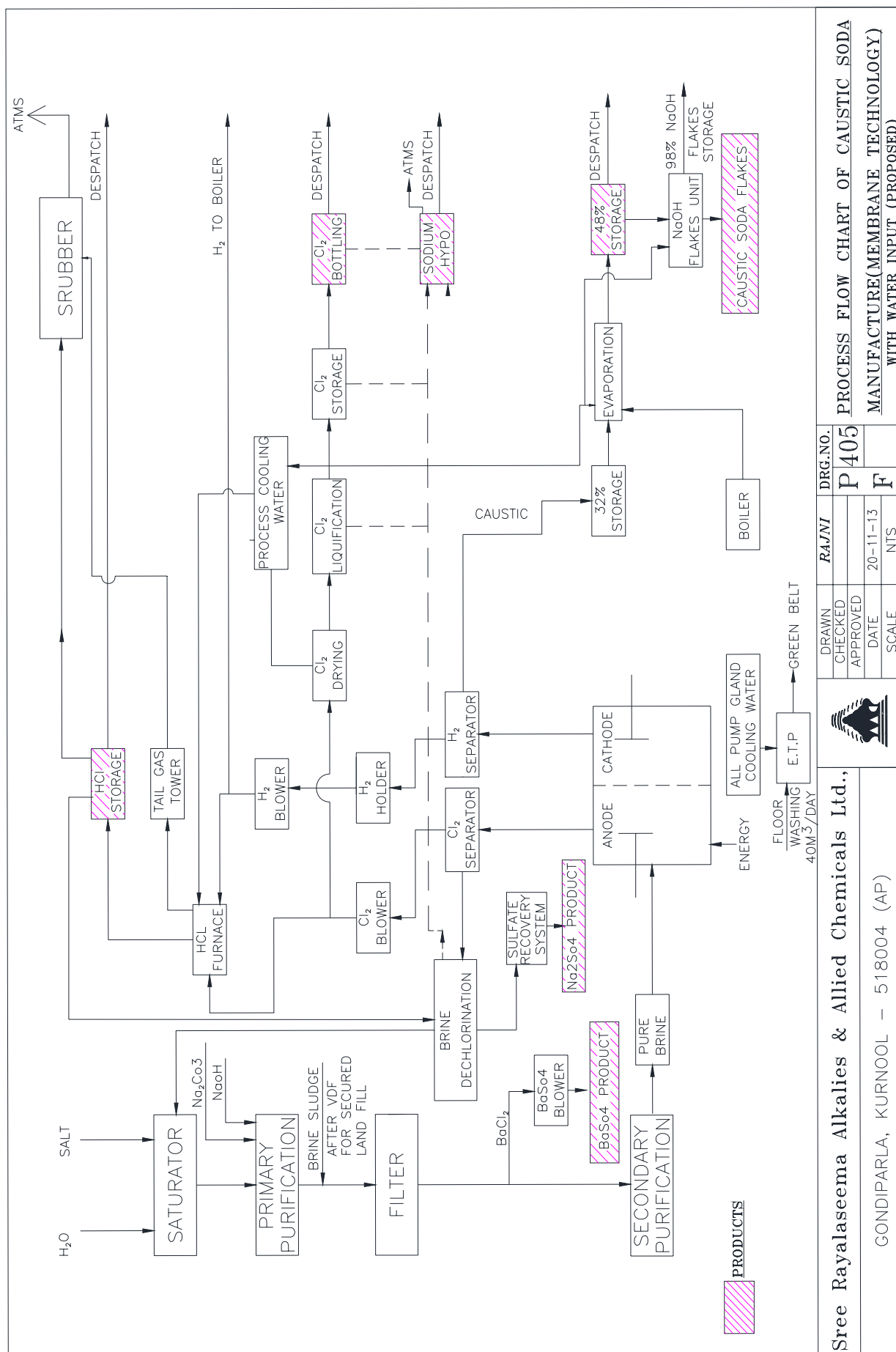


Table 2.2 Mass Balance of Caustic Soda - 100 Tons

S.No	INPUT	Quantity (Tons)	OUTPUT	Quantity (Tons)
I-Brine Purification				
1	Sodium Chloride (Common Salt)	143.5	Sodium chloride from	
			a) Return Brine	181.8
			b) Fresh salt	143.5
			c) Reaction of HCl & Caustic	2.6
2	Insoluble's	1.1	Water with brine	823.5
3	Sulphates	0.4	Barium sulphate	1.2
4	Calcium	0.2	Sludge	2.1
5	Magnesium	0.1	Water in sludge	1.2
6	Sodium Chloride through depleted brine	181.8	Water through product	57.4
7	Barium carbonate slurry	1.0		
8	Caustic soda	2.0		
9	HCl	1.7		
10	Sodium Carbonate	0.7		
11	Water along with salt	30.9		
12	RO & DM plant effluent	100.0		
13	Water along with depleted Brine	692.7		
14	Water along with Soda Ash	6		
15	Water along with Caustic soda	10		
16	Water along with HCl	3.5		
17	Water along with BaCO ₃	3.9		
18	Chelating tower effluents	24		
19	Pump mechanical seal water	9.8		
	Total	1213.4	Total	1213.4
II-Electrolysis of Brine				
1	Brine - NaCl	327.9	Sodium Hydroxide	100
	- Water	782.4	Chlorine	88.6
2	D.M.Water/Condensate	100	Hydrogen	2.5
			Water along with NaOH	214.2
			Brine - NaCl	178.8
			- Water	626.2
	Total	1210.3	Total	1210.3
III Caustic Evaporation & Fusion Plant				
1	Caustic soda	100	Caustic Soda lye	60.7
2	Water along with Caustic soda	214.2	Caustic soda lye to Brine purification	2
			Caustic soda Flakes	37.3
			Water	76
			Condensate to electrolyses	100
			Condensate to KOH electrolysis of Brine	10.5
			Condensate to Cooling tower	22.8
			Evaporation loss	4.9
	Total	314.2	Total	314.2

2.1.2 Process for the Manufacture of Potassium Hydroxide

Caustic potash is produced by the electrolysis of potassium chloride brine. Potassium chloride is the main raw material for caustic potash production. The brine treatment is similar to brine treatment adopted in caustic soda production. Co-products chlorine and hydrogen are handled along with the gases generated from caustic soda plant. Caustic potash produced in cell house also is similar to electrolysis of caustic soda. The product is enriched to 48% and 90% as per requirement in caustic evaporation and flakes unit respectively. Schematic diagram of Potassium hydroxide manufacturing process is presented in Fig 2.2 and mass balance is presented in Table 2.3.

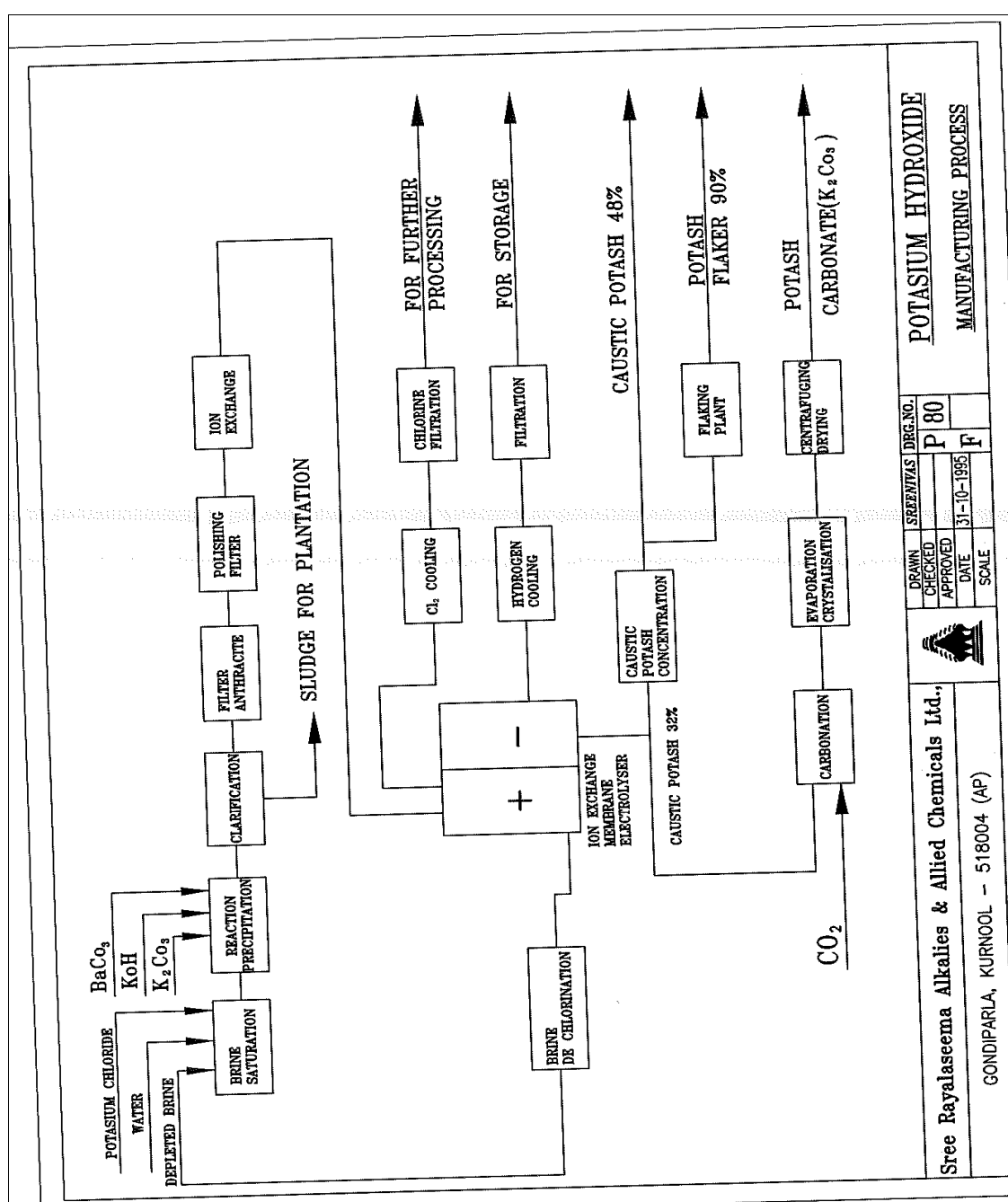


Fig 2.2 Schematic Diagram of Potassium Hydroxide Manufacturing Process

Table 2.3 Mass Balance of Potassium Hydroxide- 100 Tons

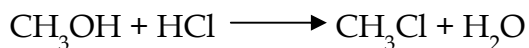
S.No	INPUT	Quantity (Tons)	OUTPUT	Quantity (Tons)
I-Brine Purification				
1	Potassium chloride	132	Potassium chloride from	
			a) Return Brine	97.14
			b) Fresh salt	132
			c) Reaction of HCl & Potassium Carbonate	1
2	Insoluble's	0.15	Water with brine	615.01
3	Sulphates	0.49	Sludge	1.2
4	Calcium	0.23	Water in sludge	0.45
5	Magnesium	0.1	Water through product	22.5
6	Potassium Chloride through depleted brine	97.14		
7	Barium carbonate slurry	0.21		
8	Potassium Hydroxide	0.71		
9	HCl	0.43		
10	Potassium Carbonate	0.7		
11	Water along with salt	1.5		
12	Water along with depleted Brine	463		
13	Water along with Potassium Carbonate	3		
14	Water along with Potassium Hydroxide	3		
15	Water along with HCl	1		
16	Water along with BaCO ₃	0.64		
17	Condensate	157		
18	Pump mechanical seal water	8		
	Total	869.3	Total	869.3
II-Electrolysis of Brine				
1	Brine - KCl	230	Potassium Hydroxide	100
	- Water	615.02	Chlorine	63.22
2	D.M. Water/KOH Condensate	98.08	Hydrogen	1.78
			Water along with KOH	217.9
			Brine - KCl	97.2
			- Water	463
	Total	943.1	Total	943.1
III Caustic Evaporation & Fusion Plant				
1	Potassium Hydroxide	100	Potassium Hydroxide	99.3
2	Water along with Potassium Hydroxide	217	Water along with Potassium Hydroxide	10
			Potassium Hydroxide to Brine Purification	0.7
			Water along with KOH used for Brine plant	3
			Condensate to electrolyses	43
			Condensate to brine purification	157
			Evaporation loss	4
	Total	317	Total	317

2.1.3 Process Description of Chloromethanes (CMS)

The production process of Chloromethanes consists of the following stages, which are described as follows:

I. Hydro chlorination Section

The reaction of this stage proceeds as follows:

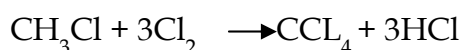
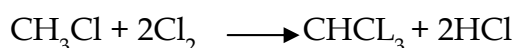
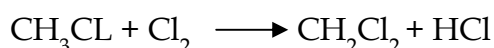


Methanol, vaporized by CH₃OH Evaporator, is fed to the hydro chlorination Reactor at an optimum ratio with hydrogen chloride. The reaction is carried out in vapor phase in the presence of catalyst to produce methyl chloride. Methyl chloride thus obtained is washed with quench liquid itself from condenser in Quench tower to remove a small amount of un-reacted methanol and hydrogen chloride. It is further washed with Caustic tower to remove traces of acidity followed by concentrated sulfuric acid tower to remove moisture. After these treatments, purified methyl chloride is compressed through CH₃Cl compressor and then it is condensed and collected in a receiver from which it's sent to the chlorination section. 21%HCl from Quench vessel (S2103) is sent to HCL absorption unit to form 31%HCl. The spent sulfuric acid from the bottom of the Dehydrator has a concentration of 85~90% is sold as spent sulfuric acid.

II. Thermal Chlorination Section

Methyl chloride reacts with chlorine in vapor phase in a vessel reactor to form higher chlorinated Chloromethanes.

The reaction of this stage proceeds as follows:



The reactions are carried out at high temperatures and middle pressures. By control of reaction conditions and ratio of feedstock and recycling Chloromethanes, methylene chloride, chloroform and carbon tetrachloride are formed at desired production ratios. Firstly, Methyl chloride, vaporized by Evaporator is sent to the reactor by means of flow control. Meanwhile, the vapor chlorine, from OSBL, is also sent to chlorination reactor by means of flow control. The recycled organics mainly methyl chloride, methylene chloride and hydrogen chloride, the vapor organics are sent to reactor by

means of flow control. The vapor reactant, with high temperatures, is cooled in Quench tower, then hydrogen chloride is separated from CMS compounds through condensers). Large amounts of hydrogen chloride are recycled to hydro chlorination to produce methyl chloride, HCl is sent to HCl Absorption unit to produce 31% HCL.

The vapor organics mainly methyl chloride, methylene chloride and hydrogen chloride, from the top of Recycling tower, are partly recycled to reactor in order to control the temperature of reactor and the ratio of production, and the balance is sent to recycling tower as reflux liquid, the mixture of methylene chloride, chloroform and carbon tetrachloride, are sent to Rectification section, from the bottom of the recycling tower. Schematic diagram of Chloromethanes manufacturing process is presented in Fig 2.3. Material balance of Chloromethanes is presented in Table 2.4.

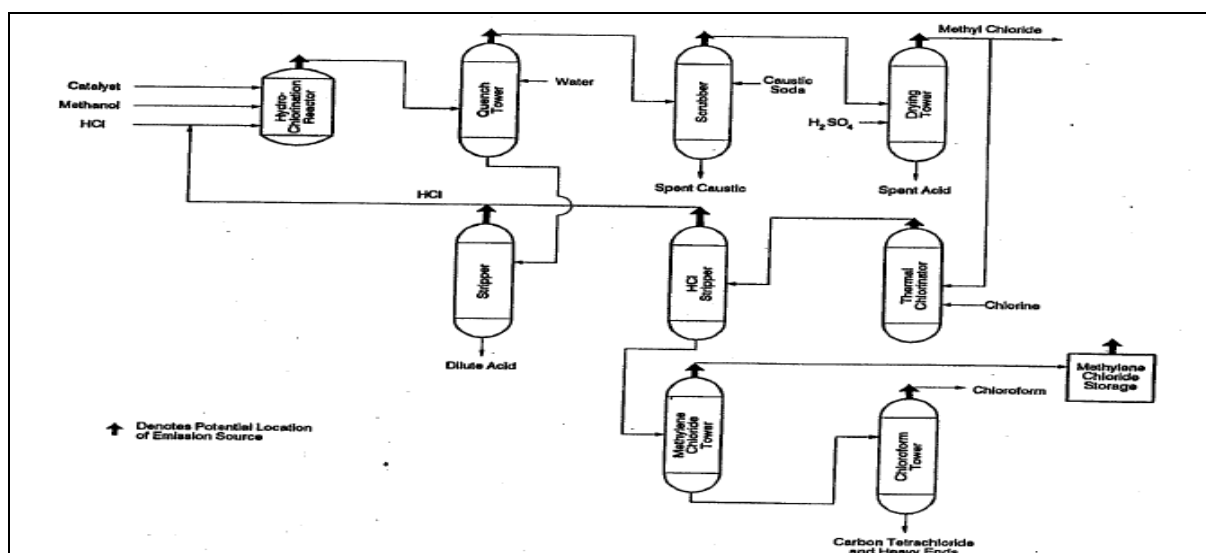


Fig 2.3 Schematic Diagram of Chloromethane Manufacturing Process

Table 2.4 Material Balance of Chloromethane

Input	Quantity (TPD)	Output	Quantity (TPD)
Methanol	82.58	Methyl Chloride	10.45
Chlorine	242.2	Methylene Chloride	122
Dilute Caustic (10%)	6.5	Chloroform	120.45
Sulfuric acid (98 %)	9.1	Carbon tetra chloride	15.2*
Water for Cooling towers and Scrubbing	1416	32 % Hydrochloric acid	134.8
Water for HCl scrubbing media	100	Spent Sulfuric Acid (75 - 80%)	11.9
		Sodium Chloride Solution (10 %)	9.5
		Water Evaporation Loss	1297.1
		Cooling Tower Blow downs	129
		Organic residue from process	6.0
Total	1856.4	Total	1856.4

*CH₃Cl to be reused

First, the product **mixture** is separated and purified. It is fed to caustic washing drum to remove acid and fed to azeo tower where water is removed from the product. The spent caustic soda from caustic washing drum is sent to effluent treatment section.

In normal production, most of the by-product hydrogen chloride from the chlorination unit is sent to the hydro chlorination unit to produce methyl chloride, and the excess hydrogen chloride is absorbed in this section along with 21% HCl received from hydro chlorination units (Quench tower) and process water to form concentrated hydrochloric acid, which is then stripped in the organic stripper to remove organic matters to produce by-product 31% HCl. Schematic diagram of HCl absorbing unit is presented in

Fig 2.4.

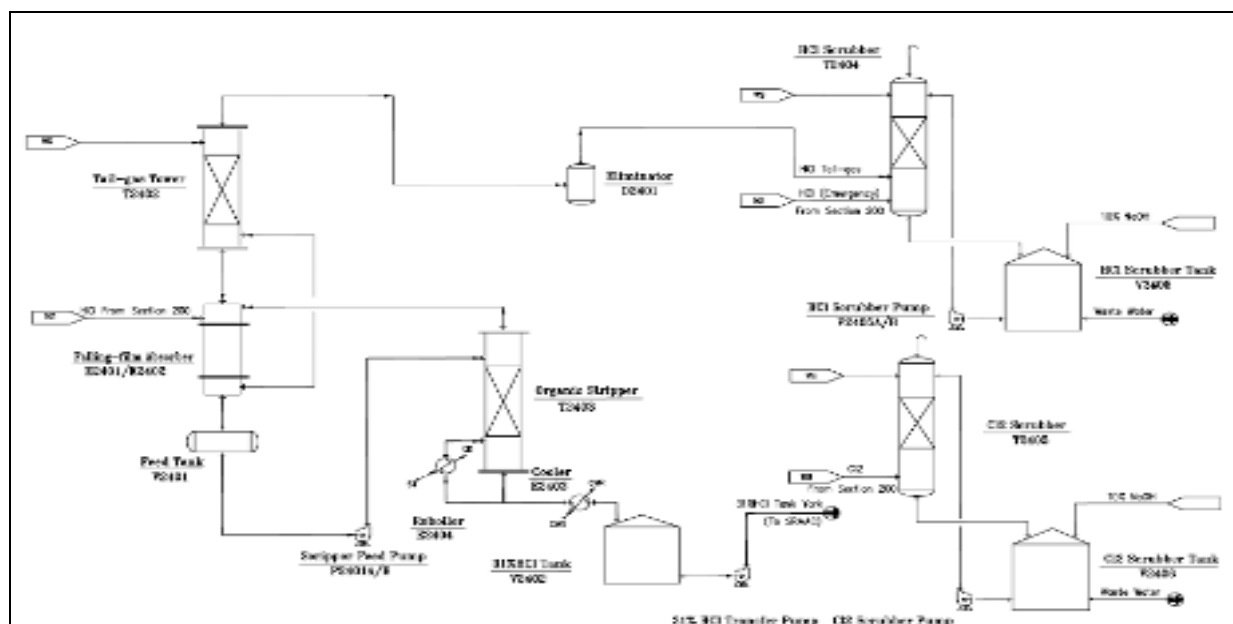


Fig 2.4 Process flow diagram for HCl Absorber

This unit is also equipped with HCl scrubber and emergency chlorine off-gas scrubber to scrub and neutralize the off-gas containing HCl and Cl₂ received from various sections of the plant with 10% NaOH and water. The schematic diagram of HCl scrubber and emergency chlorine off-gas treatment scrubber is presented in [Fig 2.5](#).



through Dryers. The acid free gas shall be compressed and condensed using water. The condensed product is diverted to crude intermediate storage tank. From these storages, the crude refrigerant shall be fed to Distillation columns to distill and get pure Chlorodifluoromethane. Schematic diagram of Chlorodifluoromethane is presented in **Fig 2.6** and material balance is presented in **Table 2.5**.

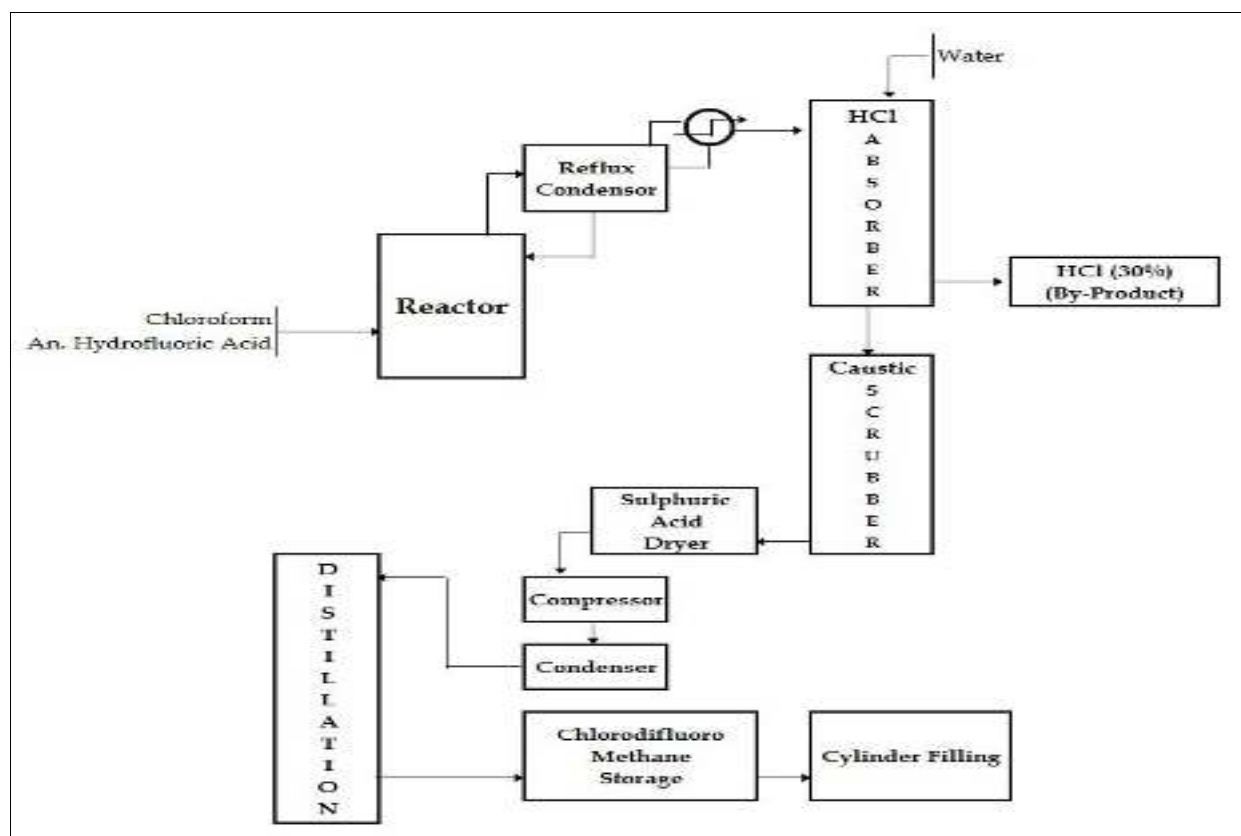


Fig 2.6 Schematic Diagram of Chlorodifluoromethane

Table 2.5 Material Balance of Chlorodifluoromethane

Input	Quantity (TPD)	Output	Quantity (TPD)
Chloroform	13.9	Chlorodifluoromethane	10
Anhydrous Hydrogen Fluoride	6.7	Hydrochloric acid (30%)	27.6
Dilute Caustic (10%)	1.85	Water Evaporation Loss	370.6
Sulfuric acid (98 %)	1.89	Cooling Tower Blow downs	15
Water for Cooling towers and Scrubbing	404.5	Antimony Pentoxide	0.2
Water for HCl scrubbing media	11.8	Spent Sulfuric acid (75%)	17.3
Antimony Pentoxide	0.2	Sodium Chloride	0.3
Total	440.9		440.9

2.2 Utilities (Terms of Reference No.B.6 & A.16)

No additional utilities are proposed for expansion. The required steam will be met from existing coal fired boiler. It is proposed to establish standby DG sets of capacity 500 Kva in addition to existing stand by DG sets. List of utilities is presented in **Table 2.6**.

Table 2.6 List of Utilities

S.No	Description	Existing	Proposed	Total after expansion
1	Coal Fired Boiler	110 TPH	-	110 TPH
		100 TPH	-	100 TPH
		45 TPH	-	45 TPH
2	DG Sets**	5 x 6.2 MW	-	5 x 6.2 MW
		1 x 160 kVA	-	1 x 160 kVA
		1 x 285 kVA	-	1 x 285 kVA
		1 x 400 kVA	-	1 x 400 kVA
		1 x 500 kVA	1 x 500 kVA	2 x 500 kVA
3	Oil and H ₂ fired boiler*	3 TPH	-	3 TPH
4	Waste Heat Recovery Boiler (WHRB) connected to DG sets*	3 TPH	-	3 TPH
5	Oil fired boiler*	3 TPH	-	3 TPH

* Shall be kept as standby

**DG sets will be used during load shut down periods only.

2.3 Water Requirement (Terms of Reference No. 3(vii), A.16 & B.6)

The water required for the plant is mainly for Process, Scrubbers, and washings, cooling tower makeup, process, steam generation and domestic purposes. The total water requirement shall increase from 12.137 MLD to 15.684 MLD out of which 15.167 MLD shall be fresh water and 0.517 MLD shall be recycled water. The required water is drawn from Tungabhadra River through infiltration wells. The unit obtained permission to abstract water from Tungabhadra River in the order of 20MLD. The fresh water requirement is presented in **Table 2.7** and water balance is presented in **Table 2.8**.

Table 2.7 Total Fresh Water requirement

S.No	Description	Quantity (MLD)		
		Existing	Proposed	Total after expansion
1	Chlor-Alkali Plant (or) Potassium Hydroxide	1.98	1.765	3.745
2	Oil and Fatty Acid	0.317		0.317
3	Chloromethanes	0.85	0.845	1.695
4	Chlorodifluoromethane	---	0.42	0.42
5	Co-generation Power Plant	8.99	---	8.99
	Total	12.137	3.03	15.167

Table 2.8 Total Water Balance

Purpose	INPUT (KLD)				OUTPUT (KLD)			
	Fresh Water		Recycled Water		Loss		Effluent	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Chlor-Alkali Plant	1980	1765	280	108	1995	1709	265	165
Oil and Fatty Acid	317							
CMS and CDFMs	850	1265	67	62	830	1245	87	82
Co-Generation Power Plant	8990				7905		1085	
Gross Total	12137	3030	347	170	10730	2954	1437	247
Total	15167		517		13684		1684	

I. Chlor-Alkali Plant

Purpose	INPUT (KLD)				OUTPUT (KLD)			
	Fresh Water		Recycled Water		Loss		Effluent	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Process	730	700			673	616	97.5	94.0
Floor Washings	40	10						
Pump Gland Cooling	60	40			1027.5	982.5	82.5	62.5
Cooling Towers	1050	1005						
Domestic	100	10			15	2	85	8
Gardening			280	108	280	108		
Gross Total	1980	1765	280	108	1995	1709	265	165
Total	3745		388		3704		430	

II. Chloromethanes & Chlordifluoro Methane

Purpose	INPUT (KLD)				OUTPUT (KLD)			
	Fresh Water		Recycled Water		Loss		Effluent	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Process - CMS	20	20			20	20		
Process - CDFM		420				420		
Scrubbers	20	20					20	20
Cooling Towers	800	800			743	743	57	57
Domestic	10	5					10	5
Green Belt			67	62	67	62		
Gross Total	850	1265	67	62	830	1245	87	82
Total	2115		129		2075		169	

CMS: Chloromethanes

CDFM: Chlorodifluoro Methanes

III. Co-Generation Power Plant

Purpose	INPUT (KLD)				OUTPUT (KLD)			
	Fresh Water		Recycled Water		Loss		Effluent	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Floor Washings	30						30	
DM Plant and Boiler Feed	1500				1095		405	
Cooling Towers	7400				6800		600	
Domestic	60				10		50	
Gross Total	8990	0	0	0	7905	0	1085	0
Total	8990		0		7905		1085	

405KLD - 330 KLD of DM Regeneration is reused for Brine makeup chlor-alkali plant and 75 KLD is reused for Green Belt

1030 KLD of DM water is supplied to Chlor-Alkali Plant and 65 KLD is boiler loss

2.4 Pollution Control Facilities

2.4.1 Water Pollution

The main sources of effluent generation from the plant are from process, floor washings, blow downs from boiler and cooling tower and domestic effluents. Effluents from process, washings, utility blow downs and domestic wastewater of Chlor-Alkali, Oil and fatty acid division and co-generation power plant will be sent to the effluent treatment system and treated effluent reused for greenbelt development and process. Effluent from chloromethanes and proposed chlorodifluoromethanes are sent to effluent treatment followed by RO. RO permeate reused for process and rejects recycled for brine saturation of Chlor-alkali plant. The total effluent generated and mode of treatment is presented in [Table 2.9](#).

Table 2.9 Total Effluent Generated and Mode of Treatment

S.No	Description	Quantity (KLD)		Mode of Treatment/Disposal
		Existing	Proposed	
I	Chlor-Alkali (Or) Potassium Hydroxide			
1	Process	97.5	94	Sent to effluent treatment plant of Chlor-alkali followed by Ultra filtration and RO. Permeate reused for process and rejects sent for brine saturation.
2	Washings			
3	Gland Seal			
4	Cooling towers blow down	82.5	62.5	
5	Domestic	85	8	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - I	265	165	
II	Chlormethanes and Chlorodifluoromethanes			
1	Cooling towers blow down	57	57	Sent to effluent treatment plant of Chlor-alkali followed by Ultra filtration and RO. Permeate reused for process and rejects sent for brine saturation.
2	Scrubbers	20	20	
3	Domestic	10	5	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - II	87	82	
III	Co-Generation Power Plant			
1	Floor Washings	30	---	Sent to effluent treatment plant and treated effluent reused for greenbelt development.
2	Cooling towers blow down	600		
3	Domestic	50		
4	DM Plant /RO Rejects	405	---	330 KLD is reused for Brine make-up in chlor-alkali plant and 75 KLD reused for green belt development.
	Total -III	1085	---	
IV	Non EC Products	50	---	Sent to effluent treatment plant and treated effluent reused for greenbelt development
Grand Total (I+II+III+IV)		1507	247	

2.4.1.1 Process Description of Effluent Treatment Plant

The effluents generated are collected in equalization tank to have uniform flow rate and effluent characteristics to subsequent treatment operations. The effluent from equalization tank is neutralized by using acid/alkali and pumped to presetting tank. After primary settling for 2.5 hours the effluents are passed to flocculent mixer where the flocculent are added. After mixing the effluent, it is settled in secondary clarifier for nine hours where the flock will be settled in the tank. The clarified effluent will be passed to treated effluent storage tank. The settled sludge in presettler and secondary clarifier will be pumped to sludge drying beds. The Characteristics Before and After Treatment of Effluent treatment plant are presented in [Table 2.10](#). Details of treatment facilities are presented in [Table 2.11](#). and schematic diagram of ETP is presented in [Fig 2.7](#). The treated effluent will be reused for green belt development within plant premises. The domestic effluents are treated in septic tank followed by soak pits.

Table 2.10 Effluent Characteristics before and after Treatment

Parameter	Effluent Characteristics	
	Before Treatment	After Treatment
PH	6-9.0	6-9.0
Suspended solids	150	<100
Total dissolved solids	2400	<2000
Chlorides	1000	<500
Sulphates	140	140
Biological Oxygen demand	25	15
Chemical Oxygen demand	200	100
Oil and Grease	<10	5

Note: All values except pH are mentioned in mg/l.

Table 2.11 Details of Treatment Facilities

S.No	Facility Description	Capacity of Unit (KLD)			
		Installed Capacity	Proposed	Total after Expansion	Operating Volume after Expansion
1	Effluent Treatment Plant	1850	300	550	486
2	Sand filter		--	600	486
3	Ultra Filtration Plant		--	600	486
4	Reverse Osmosis Plant		150	550	480

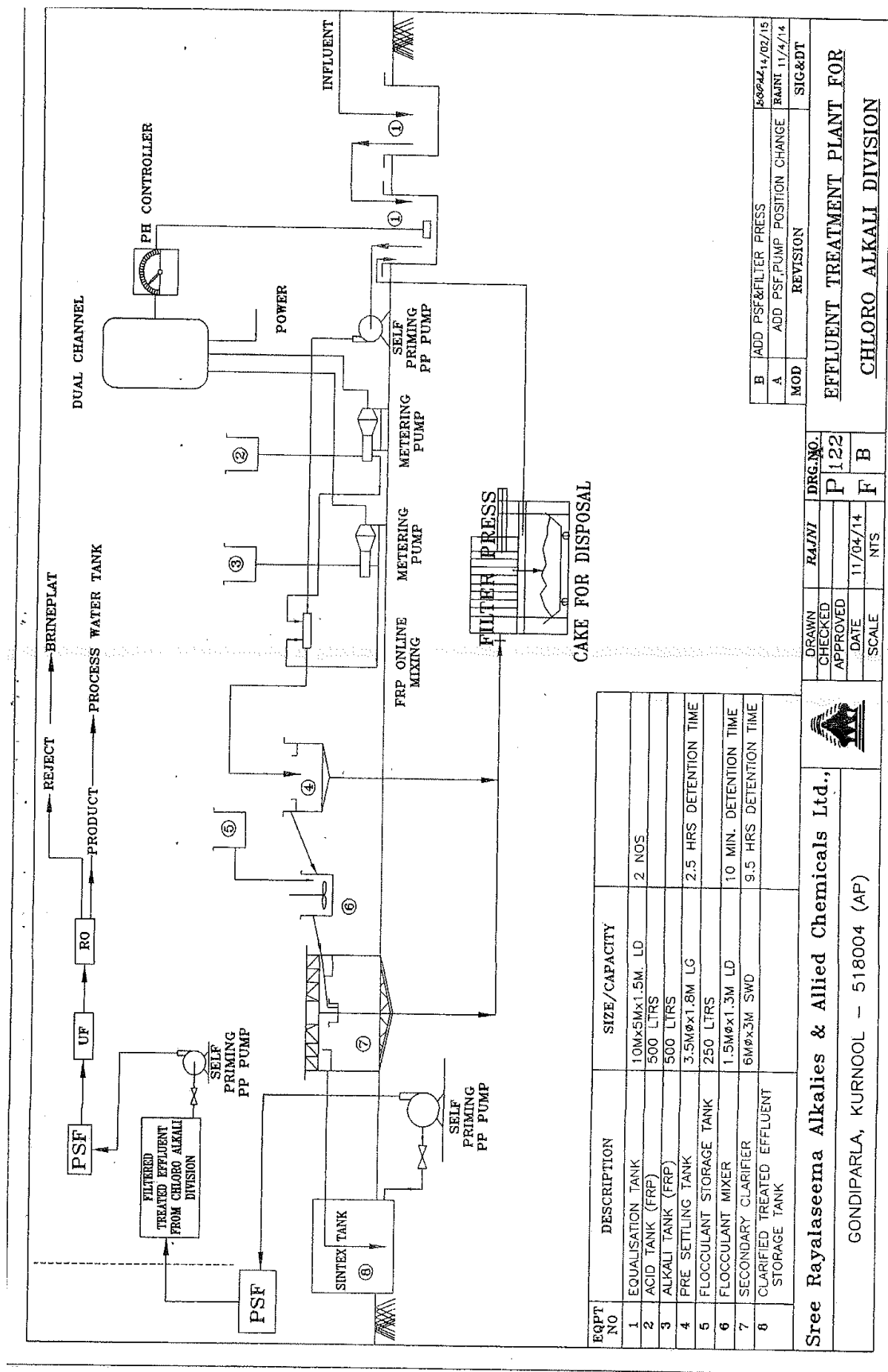


Fig 2.7 Schematic Diagram of Effluent Treatment Plant



Existing Effluent Treatment Plant Photographs

2.4.2 Air Pollution

2.4.2.1 Air Emissions from Utilities

No additional boiler proposed in the expansion except 1 x 500 KVA standby DG Set. The sources of air pollution from the plant are from 1 x 45 TPH, 1 x 100 TPH, 1 x 110 TPH coal fired Boilers, DG sets and Incinerator in chloromethane plant. The existing air pollution control equipment for coal fired boilers is Electro static precipitators (ESP). DG sets shall be provided with stack heights based on the CPCB formula for effective stack height. The emission details for the waste heat recovery boilers, Coal fired boilers and DG sets are presented in [Table 2.12](#). Other emission sources are presented in [Table 2.13](#). Technical specifications of ESP are presented in [Table 2.14](#).

Table 2.12 Details of Stacks and Emissions from the Plant

S. No	Stack attached to	Height (m)	Emission rates of Pollutants (g/sec)		
			PM	SO ₂	NO _x
1	WHR Boilers – 1 and 2	46	0.7	27.7	56.2
2	WHR Boiler-3	46	0.35	13.9	28.1
3	WHR Boiler-4	46	0.35	13.9	28.1
4	WHR Boiler-5	46	0.35	3.89	28.1
5	Hydrogen/Furnace oil fired boiler	20	Traces	Traces	Traces
6	Husk fired boiler	30	0.45	0.23	0.8
7	Salt Furnace	30	0.03	2.7	0.53

- All the units except salt furnace are kept as standby.

Table 2.13 Emission Details of Other Utilities

S.No	Stack Attached to	Stack Height (m)	Diameter of stack at top (m)	Temp. of exhaust gases (°C)	Exit Velocity (m/sec)	Pollutant Emission Rate (g/sec)			
						PM	SO ₂	NO _x	HCl
Proposed									
1	500 KVA DG Set*	5	0.25	185	7.2	0.004	0.028	0.16	-
Existing									
1	45 TPH Coal fired Boiler	55	1.37	140	10	0.95	1.44	1.56	-
2	100TPH Coal fired Boiler	69	2.5	185	11.2	3.54	5.8	6.1	-
3	110 TPH Coal fired Boiler	80	2.9	185	16	5.39	9.14	11.78	-
4	160 KVA DG Set*	3	0.12	160	20	0.002	0.022	0.12	
5	285 KVA DG Set*	3	0.12	160	6.5	0.002	0.022	0.14	
6	400 KVA DG Set*	4	0.15	165	6.5	0.003	0.024	0.15	
7	500 KVA DG Set*	4	0.25	185	7.2	0.004	0.028	0.16	
8	383kg/hr Incinerator*	12	0.6	45	7.0	-	-	2.43	0.1

*DG sets shall be kept as standby.

Table 2.14 Technical Specifications of ESP

S.No	Design Parameters	Units	Design Value		
			45	100	110
1	Gas Flow rate	Cu.m/sec	23.36	57.80	69
2	Temperature (flue gas)	° C	140	150	140
3	Dust concentration (inlet)	gm/Nm ³	56	62	112
4	Dust concentration (outlet)	mg/Nm ³	115	100	< 50
5	Number of precipitator per Boiler	No.	1	1	1
6	Number of gas path per Boiler	No.	1	1	1
7	Number of field in series	No.	3	3	5
8	Collection efficiency	%	99.84	99.84	99.9
9	Pressure drop across the precipitator	mmWC	< 25	<25	< 25
10	Velocity of gas	m/sec	0.78	1.00	0.63
11	Treatment time	Sec	18.46	15.70	41.09
12	Number of gas passage	No.	03	16	27
13	Nominal width of the ESP	m	4.8	6.8	10.8
14	Nominal length of the ESP	m	14.5	25	26.25
15	No. of collecting electrode per field	No.	180	119	196
16	Specific collecting area	M ² /M ³ /Sec	92	78.48	205.43
17	Total collecting area	M ²	4896	4536	14175
18	No. of emitting electrode in each field	No.		672	1134
19	No. of collecting electrode for ESP	No.		357	980
20	No. of emitting electrode for ESP	No.		2016	5670
21	Type of hopper and No. of hopper	No.	03	03	10 Nos.

2.4.2.2 Emissions from Process

I. Chlor-Alkali Plant

In chloro-alkali plant the gaseous emissions are chlorine and hydrogen chloride vapours. Due to advancement of control checks and due to membrane cell electrolysis, possibility of chlorine emission to atmosphere is negligible. Scrubbing systems are provided to neutralize sniff gases effectively. Even the dilute chlorine is also being converted to sodium hypochlorite after neutralisation with caustic soda at control temperature leading to value addition.

(a) Chlorine Emissions

The sources of chlorine emissions are cell house, Dechlorination unit, chlorine liquefaction and chlorine storage and filling.

Cell House

Cell house is equipped with safety inter locks, safety blow out seals, etc. Either during power failure or due to any miss operation chlorine is diverted to neutralisation unit automatically. Cell house emissions will not change after the expansion as the emissions in this section are due to failure of systems only.

Dechlorination Section

Brine after electrolysis which is called depleted brine contains about 0.3 g/l of dissolved chlorine. Since we have installed Vacuum Dechlorination system, it is suck the dissolved gas in enriched form to main chlorine header instead of blowing it to neutralisation unit. This will help to effectively liquefy all the chlorine instead of sending it neutralisation unit. This will facilitate reduction in chlorine diversion to neutralisation. Hence after expansion there will not be any emission from this operation but there will be some additional economic benefits.

Chlorine Liquefaction Section

Chlorine is generated during electrolysis as a co-product. 70% of chlorine is being liquefied and sold as liquid chlorine. After cooling, the chlorine is blown to drying unit to eliminate moisture, compressed in compressors and diverted to liquefier wherein it gets liquefied. During liquefaction, depending upon gas purity, 95% of chlorine gets liquefied and the balance quantity comes out as sniff gas and the same will be burnt in hydrochloric acid synthesis unit.

The industry is supplying Hydrogen chloride gas to a down stream unit to manufacture chlorosulphonic acid. All the sniff chlorine from chlorine liquefaction, containing about 10MT of chlorine, is burnt in synthesis unit to make Hydrogen Chloride gas instead of sending it to neutralization. In spite of increase in liquid chlorine production, all the sniff chlorine can be utilized effectively and safely as is being used now in the manufacture of Hydrochloric Acid. So there is no additional load on neutralization.

Chlorine storage filling and handling

For chlorine storage, four tanks of 100 MT capacities are available. One tank is always kept as dump tank, chlorine sensors are installed near each tank with an indication in control room to alert all, in time, in case of any leakage. Load cells are provided for indication of tank weight locally as well as in control room. Excess level alarm, excess flow shut-off valves, gas masks, etc., have been provided in storage area.

In filling section also, chlorine sensors are provided to sense leakage of chlorine. Load cells to allow correct filling of chlorine tonners are provided. Scrubbing system around the filling section to take care of accidental emissions is in operation. Apart from this, emergency kits, gas masks and trained man power are available round the clock.

To avoid chlorine storage risk totally, the industry has commissioned a scrubbing system exclusively for chlorine storage and filling area, to take care of any accidental emission and to avoid spreading of chlorine to nearby area. Arrangements are also being made to take back left over liquid chlorine, after filling, to liquefaction unit for reprocessing to reduce load on neutralisation unit.

Initially, chlorine neutralization was with milk of lime and the resultant bleach liquor was supplied to nearby paper mill. After its closure, the industry has switched over to scrubbing with caustic. Now the industry has three caustic scrubbing towers in series.

With available facilities and expertise in handling chlorine, chlorine emissions to atmosphere are being maintained between 0.6 to 1 ppm in vents. These levels are well below the prescribed limits. The industry has provided **Twenty Five** chlorine sensors at critical places like chlorine storage and filling, hypo plant. Some sensors have recording facility.

Normally chlorine goes to neutralisation from chlorine filling and brine Dechlorination. In case of either process problems or power failure, release of chlorine to neutralisation unit takes place. Chlorine neutralisation unit is provided with emergency power supply to run in case of power failure and also one blower and one caustic circulation pump are exclusively provided with Diesel engine to run in case of failure of emergency supply also. The resultant Sodium Hypo is a value added product, since it is being used in many oxidation reactions. A dedicated chilled water system is also provided to take care of heat of reaction during neutralisation and to make a quality product. There will be marginal increase in chlorine to neutralisation from filling. But as the total quantity of chlorine will be the same, the industry shall be in a position to maintain total scrubbing keeping the outlet emission well below stipulated specification.

A chlorine sensor is also provided at final neutralisation tower outlet to monitor the chlorine emission to atmosphere after neutralisation. Due to double absorption, chlorine emission from scrubber outlet is below stipulated limits. Since there is no further load on neutralisation unit, emission of chlorine to atmosphere will continue to be well below prescribed limits. With available safety precautions, equipment and skilled manpower, practically there will not be any additional chlorine emissions to

atmosphere even after expansion. The quantity of chlorine generated, captive usage and salable product is presented in **Table 2.15**.

Table 2.15 Details of Quantity of Chlorine

S.No	Description	Quantity (TPD)		
		Existing	Proposed	Total after expansion
1	Total Chlorine Generated	460	440	900
2	Chlorine for captive usage			
	a. Hydrochloric Acid	155	135	290
	b. Sodium Hypochlorite	5	5	10
	c. Liquid Chlorine	300	300	600
	Liquid Chlorine Distribution			
	a. Chloromethane	130	130	260
	b. Sree Rayalaseema Hi-Strength Hypo Ltd.	150	50	200
	c. Domestic Market	20	120	140
3	Total Chlorine Storage Capacity (MT)	4 x 100	--	4 x 100*

Note:

1. However chlorine to HCl and liquid chlorine production will vary according to market demands.

2. To consume additional chlorine produced from proposed expansion, it is proposed to promote entrepreneurs to establish chlorine derivate products like CPW.

* 1 x 100 MT kept empty to transfer the material from other tank in case of emergency. The excess chlorine will be sold as product.

II. Chloromethanes Plant

(a) HCl Absorption

Majority of the HCl gas produced from thermal chlorination unit is used to produce methyl chloride. Excess HCl available is absorbed in HCl absorber to produce 32% HCl. To avoid emissions from HCl absorber, tail gas vents are connected to a tail gas tower followed by organic stripper to remove organics. The flow diagram of HCl absorber is presented in **Fig 2.8**.

Absorption Section (HCl Stripper)

Flue gas from incinerator at 1400 °C enters absorption section where the HCl in the flue gas is absorbed in a falling film type co current absorber using HCl solution. Main quench cooler is in shell and tube construction with falling film HCl absorber with cooling tower on service side. Tube and tube sheet is in impervious graphite construction. Cooling water is circulated in shell side while flue gas flows through tubes. In the top portion, HCl solution from tail gas / packed tower is introduced in the tubes through liquid distributor where the HCl from the flue gases is absorbed by the liquid flowing through the tubes. The liquid forms a thin film on the tubes. The absorption being exothermic process, heat is removed by circulating cooling tower from shell side. The last section is packed bed saturator, which provides enough residence time to reach saturation temperature. The liquid gets concentrated to 18-20% HCl from the flue gases. At the bottom of the absorber integral recirculation tank along with recirculation pump is provided where part of 18-20% HCl solution is circulated in tail gas packed bed tower.

Tail Gas Absorber

Tail gas absorber is a packed bed tail gas tower. The unabsorbed gases from quench absorber are passed through this tail gas packed bed tower which has packing's for maximum absorption of HCl. The part residual HCl not absorbed in the above absorber are further absorbed with the help of DM water and HCl solution. Thus weak acid generated due to this is then sent to quench cooler absorber as inlet. The flue gases from tail gas absorber are then sent to a final polishing scrubber.

Scrubbing Section

Remaining HCl and Cl₂ in flue gas is removed by absorption in alkali solution (5% caustic solution) in a scrubber. It is a packed column installed directly on top of tail gas tower but isolated by a chimney tray. Reducing agent in the form of sodium sulfate solution (5% solution) is also added along with alkali solution to decompose NaCl and Na₂SO₄ (at 5% solution) is discharged as bleed from the recirculation tank of the scrubber. The industry has installed 3 no.s of chlorine sensors and 5 no.s of VOC analyser in Chloro methane plant at thermal chlorination, shift tank area and methanol storage area.

Stack

The clean flue gas is exhausted to the atmosphere through a stack at 30m elevation. The stack is also mounted above packed tower. The entire system operates on a force draft generated by combustion air fan to overcome pressure drop in the system. The combustion air fan also provides continuous cooling air for furnace mountings. Schematic Diagram of incinerator is presented in **Fig 2.9** and Technical specifications of incinerator is presented in **Table 2.16**.

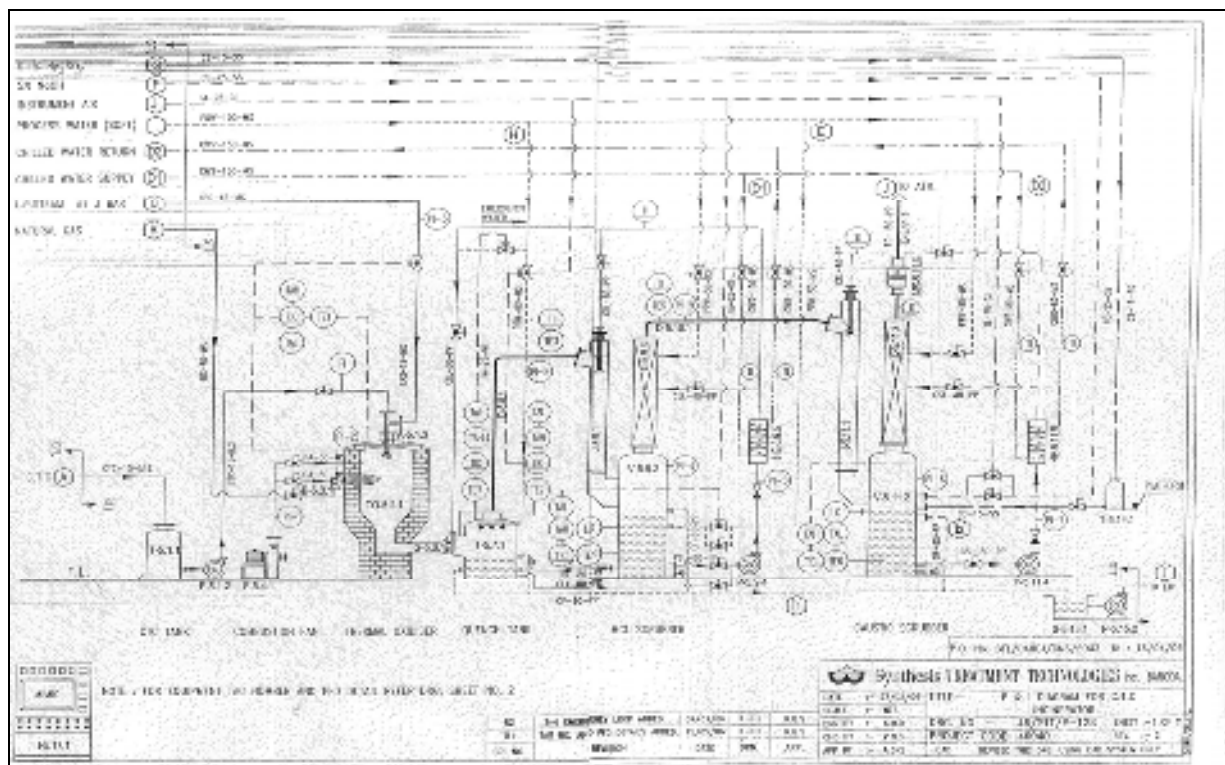


Figure 2.9 Process Flow diagram for Incinerator

Table 2.16 Technical Specifications of Incinerator

S.No	Particulars		System Capacity (Max)
1	Waste liquid CCl ₄ , 99.5% pure Feed Rate		333 Kgs/hr. Max
2	Waste Heavy ends for CCl ₄ rectification		10 kgs/hr. Max
3	Hydrogen Gas consumption (Operation)		5 to 10 kgs/hr. Max
4	LPG Pilot Burner Designed for startup		15 Kgs/hr
5	Cooling water circulation rate at 32°C at min 3.5 kg/cm ² gpr		80 m ³ /hr
6	DM Soft water for HCl absorber		750-1250 kg/hr at 30°C
7	Electrical Power (kw) with stand-by pump		45
8	Installed power (kw) with standby pumps		81
9	Low pressure steam at 3 kg/cm ² gpr		50 kgs/hr. Max
10	Instruments grade compressed air at 4 kg/cm ² g. pressure		6 Nm ³ /hr
11	Emergency water at 3 kg/cm ² g. pressure at 32°C		75 m ³ /hr
12	7% NaOH solution	Nominal when generating 25-30% HCl	25 - 50 kg/hr nominal
13		When too much of impurities in in-coming CCl ₄	750 Kg/hr. Max

		complete, HCl generated has to be neutralized and send to ETP	
14	5 % Na ₂ SO ₄ solution		5 - 10 kg/hr. Max
15	Make-up water requirement when full HCl to be neutralized		7 kl/hr
16	Bleed water (6.5 - 7% conc), when full HCl to be neutralized		8 kl/hr
17	Space requirement		15 Mtr.L x 15 Mtr. W x 16 Mtr. H

2.5 Solid Waste

2.5.1 Solid Wastes from Chloromethane and Chlorodifluoromethane Plant

Used silica gel, calcium chloride, Calcium Fluoride, Antimony Pentoxide and Spent Sulfuric Acid are the wastes generated from the process. These are generated from moisture removal steps of process. Used silica gel and calcium chloride sent to secured landfill within plant premises. Spent sulfuric acid sold as by-product and Calcium Fluoride sold to hydrogen fluoride manufacturers.

2.5.2 Solid Waste from Chloralkali

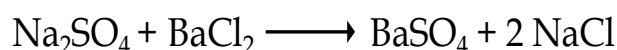
Sludge is generated during brine purification stage, and barium sulfate is recovered from the sludge and is sold as by product. The sludge generated from the effluent treatment plant will be disposed to landfill within plant premises, which contains mostly inorganics. The quantity of sludge generated depends on composition of salts used. The chemical composition of brine sludge is provided in [Table 2.17](#). The details of various sources and quantities of solid waste generated before and after expansion and disposal methods are presented in [Table 2.18](#). The plant is having its own secured land filling site.

Table 2.17 Chemical composition of Brine Sludge

S.No.	Parameter	Percentage (w/w)
1.	Moisture	30
2.	Sand + Clay	40
3.	Calcium carbonate	20
4.	Magnesium hydroxide	9
5.	Barium sulphate	1

2.5.3 Barium Sulfate Recovery from Brine Sludge

SRAACL developed in-house technology to recover Barium sulfate from brine sludge by selective precipitation.



Alternatively the industry is also planning to install sodium sulfate recovery system from brine sludge using Nano filtration, centrifuge and crystallizer. The resultant product sodium sulfate is sold as product. During the processing of salt for brine system all the impurities have to be removed down to ppb levels except sulphate level which can be maintained up to 6 gms per litre. Taking this aspect to advantage sulphate is precipitated selectively, by taking part of depleted brine stream from the electrolyzers, with barium salt as barium sulphate. Depleted brine is free from all the impurities and hence there would not be any contamination of the precipitated barium sulphate product.

After precipitating the barium sulphate the brine stream is diverting back to the system for saturation. The sulphate level in the system is being kept constant as the withdrawal from the system is in proportion that adds to the system from salt addition.

The selective precipitation achieves the product in pure form with only sodium chloride contamination. The chlorides are washed in centrifuge and the material is dried, pulverized to the required particle size and then bagged for final dispatch.

Table 2.18 Solid waste generation and mode of disposal

S. No	Description	Units	Existing	Proposed	Total after expansion	Method of Disposal
Chloro-Alkali Plant						
1	Sludge from Pretreatment of brine on dry basis	TPD	16	16	32	Secured landfill within Plant premises
2	Barium Sulphate	TPD	5	5	10	Sold as By-Product
3	Sodium Sulphate	TPD	---	10	10	Sold as By-Product
Potassium Hydroxide						
1	Sludge	TPD	0.71	0.71	1.42	Secured landfill within Plant premises
Chloromethanes Plant						
1	Calcium Chloride	TPD	0.02	0.02	0.04	Secured landfill within Plant premises
2	Silica gel	TPD	0.018	0.018	0.036	
3	Spent Sulfuric acid (75-80%)	TPD		11.9	11.9	Sold as product
Chlorodifluoromethane (R22)						
1	Calcium Fluoride	TPD	-	1.2	1.2	Secured landfill within Plant premises / Sold to hydrogen fluoride manufacturers
2	Spent Sulfuric Acid (75%)	TPD		17.3	17.3	Sold as product

3	Antimony Pentoxide	TPD		0.2	0.2	Recovered and Reused
Utilities						
1	Ash from Coal fired Boilers	TPD	570	---	570	Sold to Cement and brick manufacturers
2	Ash from Husk fired boiler*	TPD	16.5	---	16.5	Sold to Brick manufacturers
3	Sludge from Furnace Oil of DG sets*	KL	0.750	0.15	0.90	Sent to Authorized Recyclers
4	Sludge from Effluent Treatment Plant	TPD	0.140	0.140	0.28	Landfill within Plant site
5	Waste Oils*	TPA	0.15	0.15	0.30	Reused as secondary fuel
6	Used Batteries*	No's/y ear	20	15	35	Sent to Authorized Recyclers

* Generated from Stand by facilities if used

2.6 Noise Pollution

Noise is anticipated from Turbine, motors, Compressors and DG set. The DG set shall be kept in a separate enclosed room with acoustic enclosure. Noise absorbing materials are used in the construction of walls and floors. Safety equipment for noise like ear muffs and other protective devices are provided to the staff working near noise generating source. Measures are taken to mitigate the noise by providing noise minimizing barriers, shields, and enclosures wherever possible. Noise barriers in the form of trees are provided to attenuate the noise levels. The generators and the platform are properly maintained so as to minimize noise and vibrations.

CHAPTER 3.0 BASELINE ENVIRONMENTAL STATUS

3.1 Introduction

Collection of base line data is an integral aspect of the preparation of Environmental Impact Assessment Report. Baseline data reflects the present status of environment before initiation of any activity of project. The possible effects due to proposed expansion of M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited and M/s. Sree Rayalaseema Hi-Strength Hypo Limited are estimated and superimposed on the compiled baseline data subsequently to assess environmental impacts. The study was conducted in the impact area; 10 km radius area surrounding the project site, during December 2016 – February 2017. Studies were undertaken to generate baseline data of Micrometeorology, Ambient air quality (AAQ), water quality, noise levels, flora and fauna, land use, soil quality and socio-economic status of the community were collected.

3.2 Land Environment

Land and soil constitute basic components of physical environment. The location of an industrial project may cause changes in land, land use, soil and denudational processes in different intensities contingent on spatial proximity of the activity and receptors. Land and soil may be altered within the vicinity of 5 km radius and to a lesser extent upto 10 km radial distance due to development of the present industrial project.

3.2.1 Physiography

The plant site is located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The site is located at the intersection of 15° 49' 30" (N) latitude and 78° 4' 30" (E) longitude. The site elevation above mean sea level (MSL) is 300 m. The plant site is surrounded by open lands in east direction, Sree Rayalaseema Hi-Strength Hypo Limited (SRHHL) in north direction, Road connecting the NH-7 with Gondiparla village in the south and west directions. The nearest habitation from the plant is E.Tandrapadu village located at a distance of 0.5 km in northwest direction. The main approach road is NH-7 - Gondiparla village adjacent to the site in northwest direction. The nearest Town and

Railway station is Kurnool at a distance of 3.5 km in northwest direction and nearest airport is Shamshabad located at a distance of 165 km in northeast direction. Tungabhadra River is flowing from northwest to southeast direction at a distance of 1.5 km in south direction. Interstate boundary between Telangana and Andhra Pradesh is at a distance of 1.3 km in northeast direction. There are two reserve forests in the study area. Gadidmadugu RF at a distance of 5.5 km in east direction. Pullaiah RF at a distance of 9.3 km in southwest direction. There are no National Parks, sanctuaries and critically polluted area within the impact area of 10 km surrounding the site. The slope of the region is from northeast to southwest. The area has mainly single crop agricultural lands irrigated by tube wells. The site photographs are presented in **Figures 3.1**. The base map of the study area is presented in **Figure 3.2**.



Figure 3.1 Site and Plant Photographs – SRAACL*(Terms of Reference No. 4(vii))*

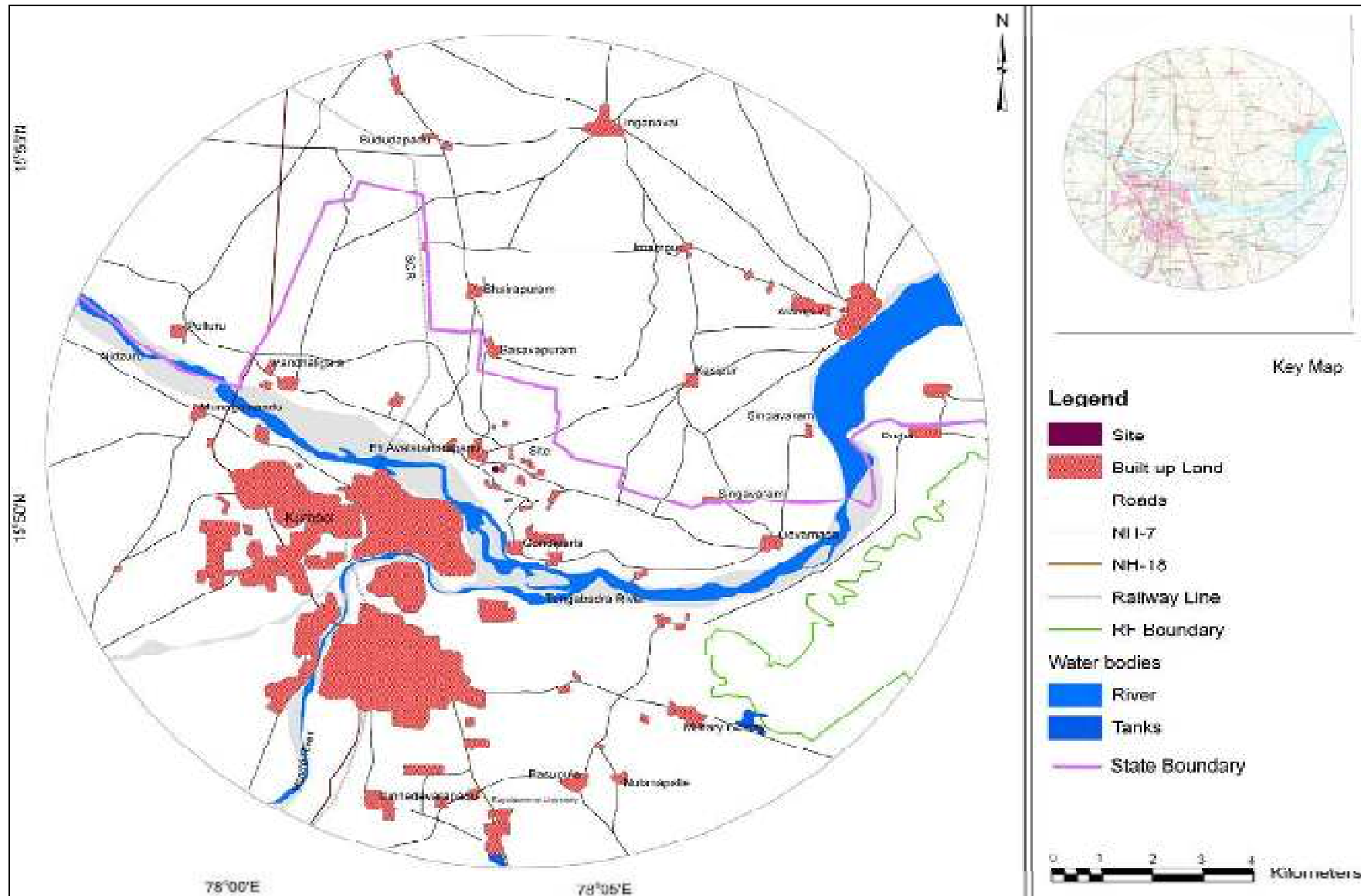


Figure 3.2 Base map of the study area

3.2.2 Geology

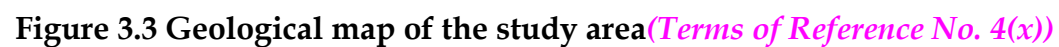
The geological formation of the impact area comprises the oldest rock formations of the earth's crust overlain by stratified deposits including Quaternary alluvium. The rocks belong to the Precambrian and Upper Crataceous to Lower Miocene periods. The rocks of the Precambrian period are generally coarse-grained granite, granite gneiss and diorite with scattered dolerite dykes. These rocks are grouped under Unclassified Crystallines.

Coarse grained granite, one of the major rock formations, is characterized by large beds of feldspars and quartz grains of uniform size with flakes of biotite and muscovite micas. At places the rocks are traversed by granite basic material. The alteration of feldspar to pockets of kaolin is a common feature. The complex gneissic formation consists of grey granite, pick granite and granite-gneiss of fine texture. The mineralogical composition of these rocks consists of quartz, feldspar, biotite and muscovite. Dolerite dykes occur at places and consist mainly of plagioclase feldspars and augite. The rocks occur as exposed boulders of varying sizes oriented along strike lines. Thin capping of basaltic are found to the south-west of the area. Isolated mounds of laterite occur in this basaltic region. Recent and older alluviums are confined to flood plains and valleys.

The basalt occurs as tongues confined to the North-Eastern portion of the area and are extensions of vast Deccan Trap to the South and the East. The maximum thickness of the basaltic is about 30 m at the highest point near to plant site. It thins out gradually towards the granite area. The chronological succession of the geological formations of the area is presented in [Table 3.1](#). Geological map of the study area is presented in [Figure 3.3](#).

Table 3.1 The Succession of Geological Formations

Geological Age	Type of Formation
Sub recent to recent	Alluvium, Colluvium, soils and valley fills
Lower Eocene	Deccan Traps: Laterites & Basalts
Upper Cretaceous	
Pre-Cambrians (Bhimas)	Sandstones, Limestones and Shales
Archean	Gneissic complex rocks, diorite, coarse grained Granite with doleritic dyke intrusions.



3.2.3 Hydrogeology

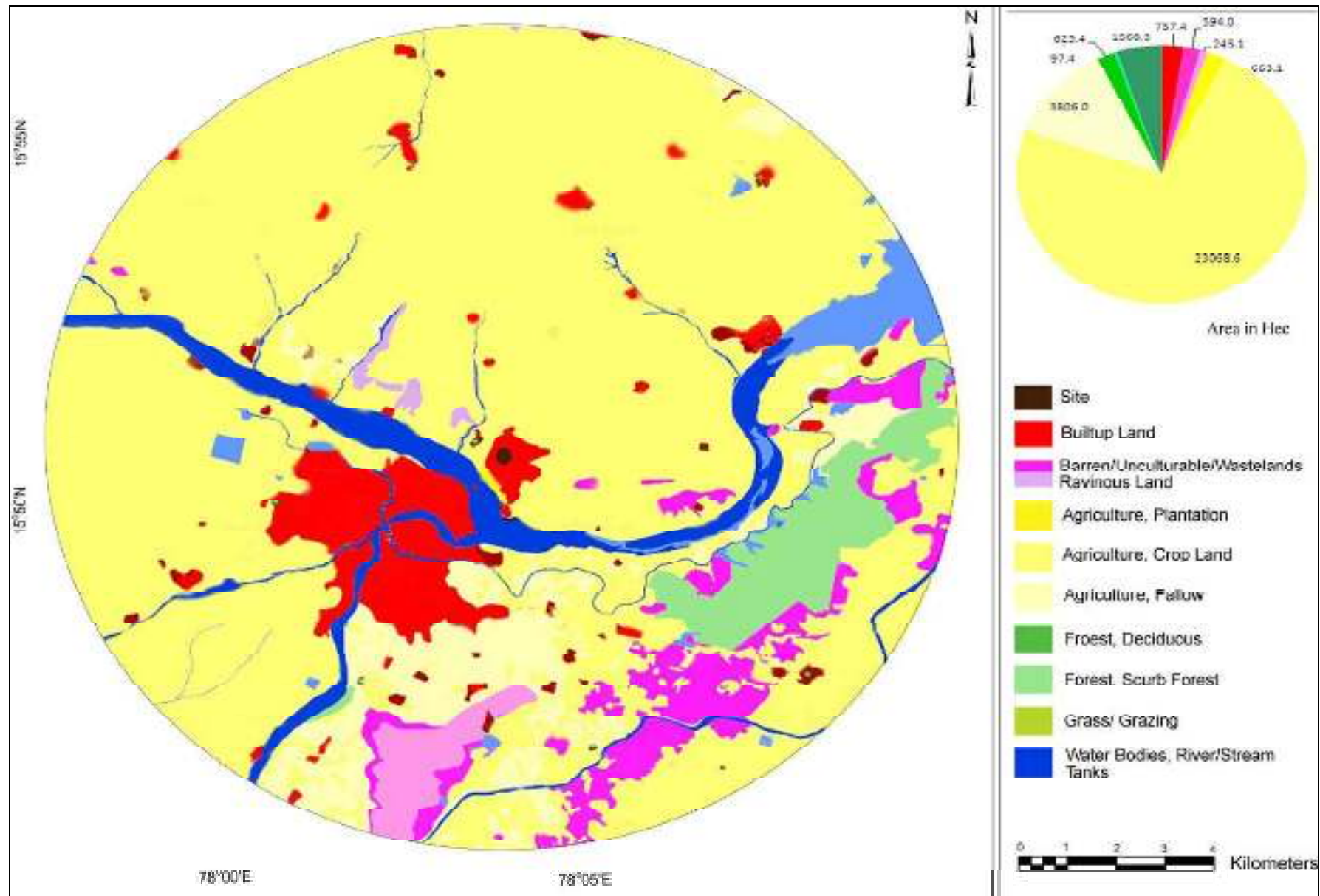
Hydrogeologically the study area is grouped under hard rocks comprising “Archaens” and “Basalts” and soft rocks comprising “Alluvium” and “Laterites”. In the Archeans ground water occurs under confined conditions in the weathered mantle, and under semi-confined conditions in the fractured and fissured zones of the fresh rock below, varying from place to place. The Central Ground Water Board (CGWB) and the State Ground Water Department have carried out an inventory of several observations wells in the study area. The observations made by these agencies are described below.

In the granitic terrain, the average depth of ground water ranges from 5-8 m in recharge areas and from ground level to about 3 m in low lying areas and valley bottoms. The productive aquifers in the granitic terrain are met at the depth of 15 – 50 m below the land surface depending upon the topography. The annual water level fluctuation in the recharge areas exceeds 9 m where as it is less than 3m in low laying areas. In basaltic terrain the maximum water level fluctuation is of the order of 20 m in recharge areas while the fluctuation along valley bottoms is about 6 m.

3.2.4 Soils

Soil may be defined as a thin layer of earth's crust that serves as a natural medium for the growth of plants. It is the unconsolidated mineral matter that has been subjected to and influenced by genetic and environmental factors such as parent materials, climate, organisms and physico-chemical action of wind, water and sunlight, all acting over a period of time. Soil differs from the parent materials in the morphological, physical, chemical and biological properties. Also soil differs among them in some or all the genetic or environmental factors, therefore, some soils are yellow, some are black, and some are coarse textured. They serve as a reservoir of nutrients for plants and crop and also provide mechanical anchorage and favorable tilth.

The Soil characteristics include both physical and chemical parameters. M/s. Team Labs and Consultants field team carried out soil survey to assess the soil characteristics of the study area. The land use and land cover map of the study are shown in [Figure 3.4](#). It may be noted that the land use land cover map reflects predominantly agricultural lands. The impact area also has a significant percentage of agriculture nature of the impact area, and also its dependence on tank for irrigation. The digital elevation model of the study area is presented in [Figure 3.5](#). The levels in the impact area range 260 m in east and 310 m in southeast. Representative soil sampling was done at various locations and these locations are shown in [Figure 3.6](#). Analytical data of soil samples is presented in [Table 3.2](#).



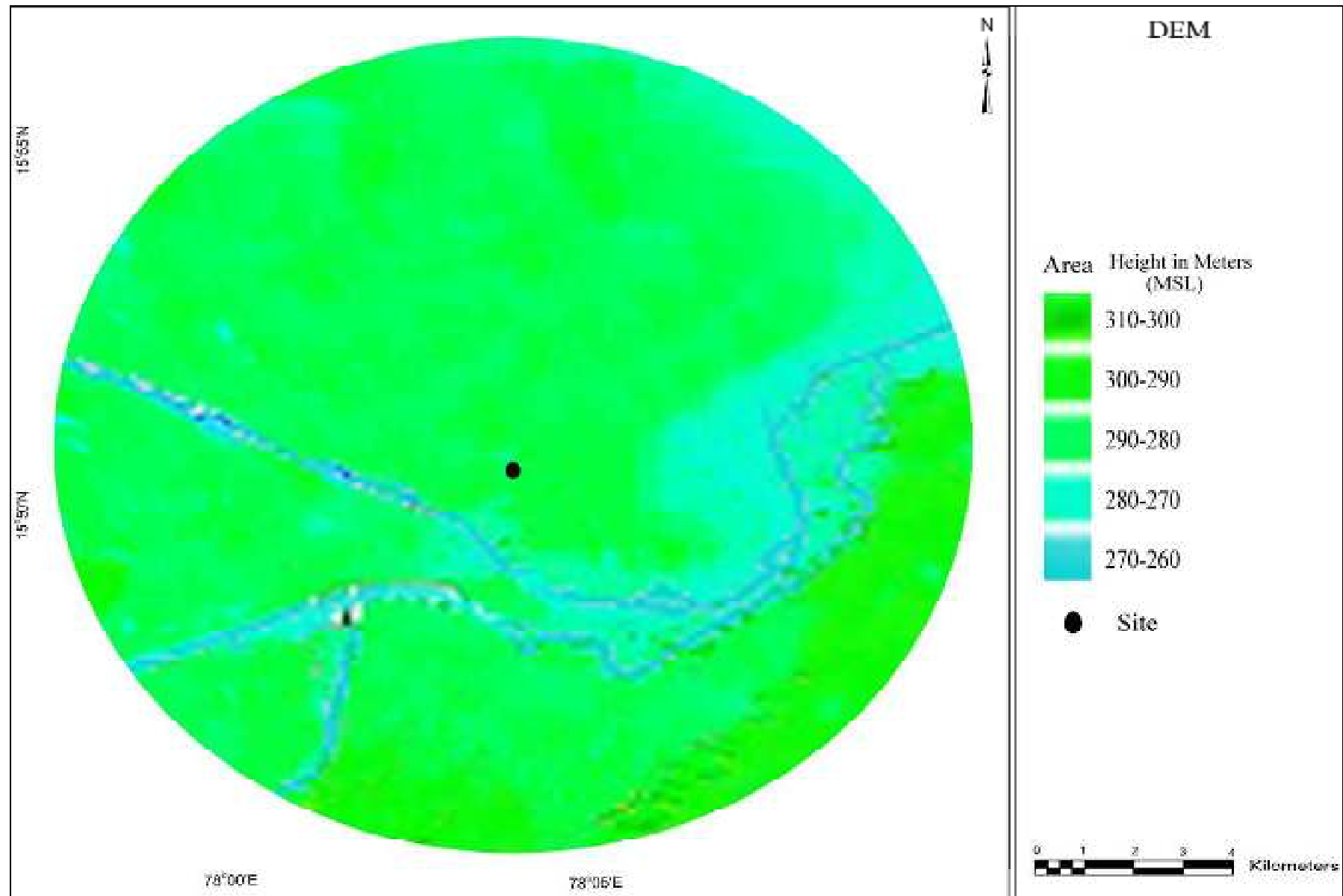


Figure 3.5 DEM of the Study Area

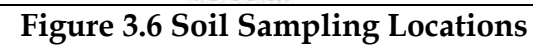


Table 3.2 Soil Analysis Data

Parameter	Unit	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9
pH	-	7.77	7.25	7.59	6.61	7.45	7.81	7.91	7.44	7.38
Electrical Conductivity (EC)	dS/m	391	380	194	127	167	171	172	209	398
Bulk Density	g/cc	1.18	1.05	1.05	1.43	1.05	1.05	1.18	1.05	1.18
Cation-Exchange Capacity (CEC)	Col(+)/kg	4.5	2.3	3.1	3.0	3.3	3.2	4.2	4.2	3.3
Infiltration rate	mm/hour	13	22	21	10	26	9	16	29	19
Porosity	%	56	60	60	46	60	60	56	60	56
Water Holding Capacity	%	5.2	11	10.7	6.0	11	9.2	8.7	7.7	18
Moisture	%	5.48	12	12	6.39	12	10	9.55	8.30	22
Organic Matter	%	4.90	0.94	1.54	1.00	1.79	2.39	0.99	4.28	1.26
Carbonates	%	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Sand	%	43	64	60	29	61	43	50	61	63
Silt	%	21	27	17	36	26	27	36	32	19
Clay	%	26	19	23	36	13	30	14	7	18
Organic Carbon	%	2.84	0.54	0.89	0.58	1.04	1.38	0.57	2.48	0.73
Nitrogen (as N)	%	0.05	0.09	0.09	0.05	0.06	0.09	0.02	0.09	0.19
Carbon / Nitrogen Ration (C/N)	-	56.9	6.0	10.4	12.5	17.5	15.9	28.6	25.4	4.0
Phosphorus (as P)	%	0.84	0.64	0.54	0.56	0.97	0.49	0.28	0.6	0.87
Potassium (as K)	mg/kg	625	206	547	611	774	553	280	531	399
Sodium (as Na)	mg/kg	446	209	169	155	123	171	595	379	98
Calcium (as Ca)	mg/kg	120	130	131	68	108	112	49	104	281
Magnesium (as Mg)	mg/kg	36	27	27	40	28	58	80	74	57
Calcium/Magnesium ratio	-	3.29	4.75	4.94	7.29	3.84	1.92	0.62	1.41	4.94
Sodium Absorption Ratio (SAR)	-	10.03	4.67	3.76	0.88	2.96	3.72	15.29	8.11	1.49
Chlorides (as Cl)	mg/kg	94	98	55	90	82	57	58	93	66
Sulphates (as SO ₄)	mg/kg	99	52	82	33	66	22	72	56	28
Aluminium (as Al)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10
Zinc (as Zn)	mg/kg	16	20	23	14	28	21	12	18	21
Texture	-	Loam	Sandy Loam	Sandy Loam	Clay Loam	Sandy Loam	Clay Loam	Loam	Sandy Loam	Sandy Clay Loam
S1-SRAACL, S2-SRHHL, S3-Eti Avalatandrapadu, S4-Gondiparla, S5-Basavapuram, S6-Kurnool, S7-kasipur, S8-Devamada and S9-Munagalapadu										

The test results of soil samples collected in the impact area are interpreted referring to the book; “Interpreting soil test results”. The reference tables are presented in **Table 3.3**. The pH of soil samples ranges from moderately acid to neutral. The cation exchange capacity of the soils is very low in all samples, contributed mainly by Potassium exchangeable ions. The level of nitrogen of the all samples is very low to low while the potassium levels are high. The calcium magnesium ratio of the samples reflects calcium is low. Bulk density of soil of impact varies from 1.05 g/cc among sand loamy soils (4 samples), 1.05 – 1.43 g/cc among Clay Loam soils and 1.18 g/cc among Loam soils. The porosity values range from 60 % among sand loamy (4 samples), 46 - 60 % among Clay Loam soils and 56 % among loamy soil. Soil texture is predominantly Sandy loam.

Table 3.3 Soil Test Results – Reference Tables (Terms of Reference No. 6(viii))

General interpretation of pH Measured		
pH	Range	Classification
	<4.5	Extremely Acidic
	4.51 -5.0	Very Strong Acidic
	5.1-5.5	Strong Acid
	5.6- 6.0	Moderately Acid
	6.1-6.5	Slightly acid
	6.6-7.3	Neutral
	7.4-7.8	Mildly Alkaline
	7.9 -8.4	Moderately Alkaline
	8.5-9.0	Strongly Alkaline
	>9.0	Very Strongly Alkaline

Source: Bruce and Rayment (1982).

Ca/mg Ratio	
	Description
<1	Ca Deficient
1-4	Ca (Low)
4-6	Balanced
6-10	Mg (Low)
>10	Mg deficient

Source: Eckert (1987)

Rating of Total Nitrogen	
Rating (% by W)	Description
<0.05	Very low
0.05-0.15	Low
0.15-0.25	Modium
0.25-0.50	High
>0.5	Very High

Source: Bruce and Rayment (1982)

Rating for Cation Exchange Capacity	
	CEC (Cmol+)/kg
Very low	<6 *
Low	6-12
Moderate	12-25
High	25-40
Very High	>40

Source: Metson (1961)

* Soils with CEC less than three are often low in fertility and susceptible to soil acidification.

Base Saturation as a Criterion of Leaching	
Range (%BS)	Rating
70-100	Very Weakly Leached
50-70	Weakly Leached
30-50	Moderately Leached
15-30	Strongly Leached
0-15	Very Strongly Leached

Source: Metson (1961)

Extractable Potassium (K)	
	K
low	<150 ppm* (< 0.4 meq/100 g soil)
medium	150-250 ppm (0.4-0.6 meq/100 g soil)
high	250-800 ppm (0.6-2.0 meq/100 g soil)
excessive	>800 ppm (>2.0 meq/100 g soil)

Source: Abbott (1989)

3.3 Water Environment (Terms of Reference No. B.8 & A.18)

Industrial development of any region is contingent on the availability of sufficient water resources, as most of the process industries require water for process or cooling purposes. The potential for exploitation of ground water resources increases as development of new projects increases in industrial and agricultural areas. With the increasing industrialization and urbanization the possibilities of contamination of surface water and ground water sources are rapidly increasing. The water resources in the area broadly fall into following categories:

1. Surface Water resources: Streams and ponds, etc.
2. Ground Water resources: Accumulation in deeper strata of ground.

3.3.1 Surface Water Resources (Terms of Reference No. 6(iv))

Tungabhadra River is flowing from Northwest to southwest direction at a distance of 1.5 km in southwest direction. There are a few surface water surface bodies like natural lakes and tanks in the study area. The drainage pattern of the impact area is dendritic and the flow is mainly into a Tungabhadra River. The drainage pattern of the impact area is presented in [Figure 3.7](#).

3.3.1.1 Surface Water Quality

The sampling locations of both ground and surface water are presented in [Figure 3.9](#). The analytical results of water samples drawn from various locations in the study area are presented in [Table 3.4](#).

Table 3.4 Water Analysis Data –Surface Water

Parameters	SW-1	SW-2	Units	Method of Analysis	IS 2296:1982
Temperature	30	29	°C	IS:3025 part 09:2002	NS
Colour	1	1	Hazen	IS:3025 part 04:2012	5
Turbidity	5	5	NTU	IS:3025 part 10:2006	5
pH	7.2	7.67	-	IS:3025 part 11:2006	6.5-8.5
Total Solids	723	1006	mg/l	IS:3025 part 15:2003	NS
Total Dissolved Solids	708	986	mg/l	IS:3025 part 16:2006	1500
Total Suspended Solids	15	20	mg/l	IS:3025 part 17:2006	NS
Total Hardness (as CaCO ₃)	171	314	mg/l	IS:3025 part 21:2009	NS
Calcium (as Ca)	28	83	mg/l	IS:3025 part 40:2009	NS
Magnesium (as Mg)	24	26	mg/l	IS:3025 part 46:2009	NS
Sodium (as Na)	205	259	mg/l	IS:3025 part 45:2003	NS
Sodium Absorption Ratio (SAR)	11.5	7.0	-	-	Ns
Potassium (as K)	17	15	mg/l	IS:3025 part 45:2003	NS
Ph Alkalinity (as CaCO ₃)	Nil	Nil	mg/l	IS:3025 part 51:2006	NS

MO Alkalinity (as CaCO ₃)	143	300	mg/l	IS:3025 part 51:2006	NS
Total Alkalinity (as CaCO ₃)	143	300	mg/l	IS:3025 part 23:2003	NS
Chloride (as Cl)	188	238	mg/l	IS:3025 part 32:2007	600
Sulphates (as SO ₄)	168	168	mg/l	IS:3025 part 24:2009	400
Nitrite Nitrogen (as NO ₃)	14	27	mg/l	IS:3025 part 34:2009	50
Silica (as SiO ₂)	2.5	3.87	mg/l	IS:3025 part 35:2003	NS
Fluoride (as F)	0.88	0.65	mg/l	IS:3025 part 60:2008	1.5
Residual, Free Chlorine	<1.0	<1.0	mg/l	IS:3025 part 26:2009	NS
Mineral Oil	Nil	Nil	mg/l	IS:3025 part 39:2013	NS
Aluminium (as Al)	<0.5	<0.5	mg/l	APHA-3500-Al	NS
Arsenic (as As)	<0.001	<0.001	mg/l	IS:3025 part 37:2003	0.2
Boron (as B)	<0.1	<0.1	mg/l	IS:3025 part 57:2010	NS
Cadmium (as Cd)	<0.1	<0.1	mg/l	IS:3025 part 41:2003	0.01
Hexavalent Chromium (as Cr ⁶⁺)	<0.05	<0.05	mg/l	IS:3025 part 52:2003	0.05
Copper (as Cu)	<0.1	<0.1	mg/l	IS:3025 part 42:2009	1.5
Iron (as Fe)	0.86	1.5	mg/l	IS:3025 part 53:2009	50
Lead (as Pb)	<0.1	<0.1	mg/l	IS:3025 part 47:2009	0.1
Manganese (as Mn)	<0.1	<0.1	mg/l	APHA-3500-Mn	NS
Mercury (as Hg)	<0.01	<0.01	mg/l	IS:3025 part 48:2003	NS
Nickel (as Ni)	<0.5	<0.5	mg/l	IS:3025 part 54:2003	NS
Selenium (as Se)	<0.001	<0.001	mg/l	IS:3025 part 56:2003	0.05
Zinc (as Zn)	0.07	0.05	mg/l	IS:3025 part 49:2009	15
SW1-Tungabhadra river upstream and SW2-Tungabhadra river downstream					

3.3.1.2 Ground Water Resources *(Terms of Reference No. 6(vi))*

Ground water is the accumulation of water below the ground surface, caused by rainfall and its subsequent percolation through pores and crevices. Percolated water accumulates till it reaches impervious strata consisting of confined clay or confined rocks. Occurrence of ground water is controlled by landform, structure and lithology. Ground water abstraction is by means of dug wells, dug cum driven wells, and bore wells. Every village has a number of traditional wells large and small. The state authorities have also provided tube wells fitted with hand pump for the drinking water requirement of villages in the study area. Presently the drinking water needs are mostly met from the ground water resources.

3.3.1.3 Quality of Ground Water

The representative samples are collected from various dug wells and bore wells in the study area. The list of sample locations is presented in [Table 3.5](#). The analytical results of water samples drawn from various locations in the study area are presented in [Table 3.6](#). The map showing the locations of sample collection ([Figure 3.8](#)) is also presented.

Table 3.5 Locations of Ground water Sampling

S. No	Location Name	Direction Form site	Distance From Site (Km)
GW - 1	SRAACL	-	-
GW - 2	SRHHL	NE	0.2
GW - 3	Etiavalatandrapadu	NW	0.6
GW - 4	Gondiparla	N	1.8
GW - 5	Basavapuram	SE	2.4
GW - 6	Kurnool	SW	1.4
GW - 7	Kasipur	NE	4.2
GW - 8	Devamada	SE	5.8
GW -9	Munagalapadu	NW	6.4

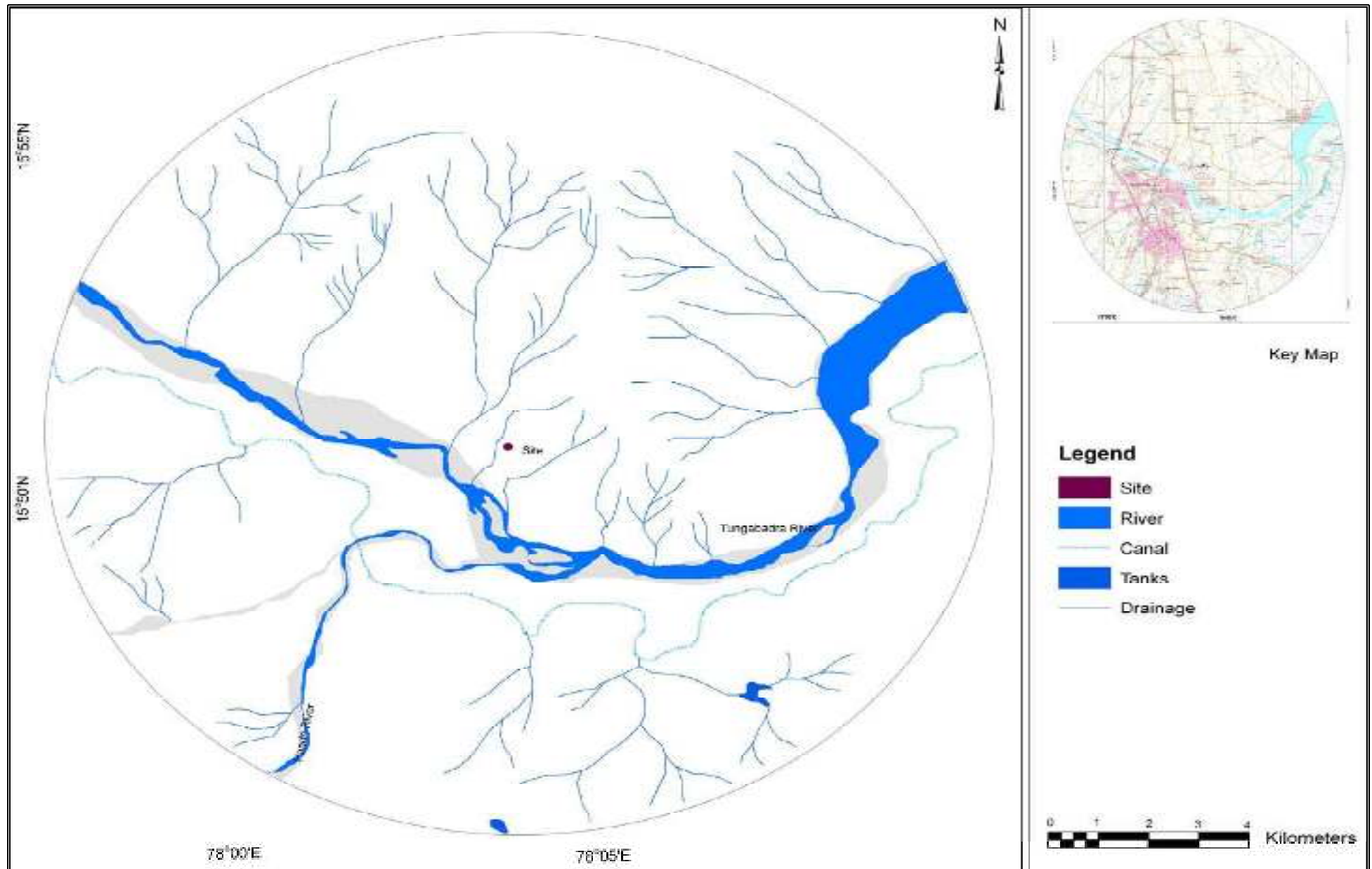


Figure 3.7 Drainage Pattern of the study area (*Terms of Reference No. 4(xi)*)

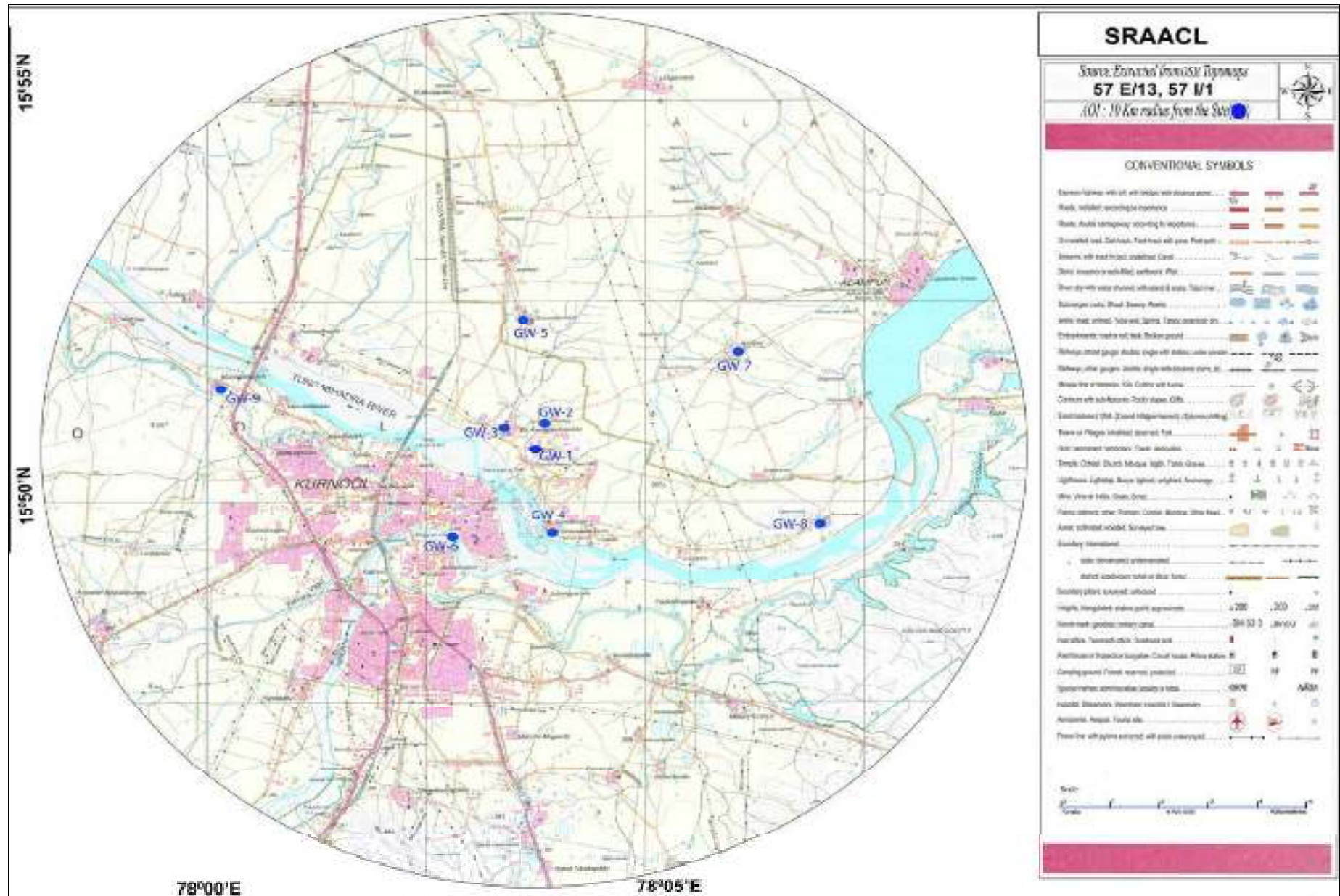


Figure 3.8 Water Sampling Locations

Table 3.6 Water Analysis Data - Ground Water

Parameters	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	GW-9	Units	Method of Analysis	IS 10500:2012 Standard
Temperature	34	29	29	30	30	29	31	34	33	°C	IS:3025 part 09:2002	-
Colour	1	1	1	1	1	1	1	1	1	Hazen	IS:3025 part 04:2012	5
Turbidity	<0.1	<0.1	10	0.1	1.1	<0.1	<0.1	0.1	0.1	NTU	IS:3025 part 10:2006	1
pH	7.17	6.96	6.99	7.32	7.22	7.98	7.5	7.65	7.55	-	IS:3025 part 11:2006	6.5-8.5
Total Solids	805	831	774	593	986	684	724	637	813	mg/l	IS:3025 part 15:2003	NS
Total Dissolved Solids	789	815	758	580	969	671	712	623	800	mg/l	IS:3025 part 16:2006	500
Total Suspended Solids	16	16	16	13	17	13	12	14	13	mg/l	IS:3025 part 17:2006	NS
Total Hardness (as CaCO ₃)	249	246	566	364	560	246	370	162	364	mg/l	IS:3025 part 21:2009	200
Calcium (as Ca)	60	63	170	99	152	55	67	22	56	mg/l	IS:3025 part 40:2009	75
Magnesium (as Mg)	24	22	34	29	44	26	49	26	54	mg/l	IS:3025 part 46:2009	30
Sodium (as Na)	201	206	67	88	140	157	143	178	175	mg/l	IS:3025 part 45:2003	NS
Sodium Absorption Ratio (SAR)	6.2	6.3	1.3	2.2	2.8	4.9	3.8	7.4	4.8	-	-	NS
Potassium (as K)	23	23	0.8	3.4	5.8	16	9.3	1.5	1.9	mg/l	IS:3025 part 45:2003	NS
Carbonate (as CO ₃)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	mg/l	IS:3025 part 51:2006	NS
Bi carbonate (as HCO ₃ ⁻)	72	48	190	120	220	157	235	238	250	mg/l	IS:3025 part 51:2006	NS
Alkalinity (as CaCO ₃)	72	48	190	120	220	157	235	238	250	mg/l	IS:3025 part 23:2003	200
Chloride (as Cl)	343	319	181	252	170	142	220	46	206	mg/l	IS:3025 part 32:2007	250
Sulphate (as SO ₄ ⁻)	114	175	120	7.5	222	167	57	130	69	mg/l	IS:3025 part 24:2009	200
Nitrate Nitrogen (as NO ₃)	3	2.5	64	28	101	24	26	71	83	mg/l	IS:3025 part 34:2009	45
Silica (as SiO ₂)	1.9	2.0	7	5.4	6.8	4.1	8.2	7.0	5.3	mg/l	IS:3025 part 35:2003	NS
Fluoride (as F ⁻)	0.7	0.3	0.7	0.8	0.6	0.6	0.7	0.2	0.7	mg/l	IS:3025 part 60:2008	1.0
Residual, Free Chlorine	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	mg/l	IS:3025 part 26:2009	0.20
Boron (as B)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	IS:3025 part 57:2010	0.50
Manganese (as Mn)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	APHA-3500-Mn	0.10
Zinc (as Zn)	0.04	0.08	0.33	0.05	0.20	0.06	0.06	0.08	0.06	mg/l	IS:3025 part 49:2009	5.0
GW1-SRAACL, GW2-SRHHL, GW3-Eti Avalatandrapadu, GW4-Gondiparla, GW5-Basavapuram, GW6-Kurnool, GW7-kasipur, GW8-Devamada and GW9-Munagalapadu												

Note: All values are expressed in mg/l except pH.

3.4 Air Environment

3.4.1 Meteorology (*Terms of Reference No. 6(i)*)

Micro meteorological studies are simultaneously conducted with ambient air quality monitoring. Meteorology plays a vital role in effecting the dispersion of pollutants, once discharged into the atmosphere, their transport, dispersion and diffusion into the environment. The meteorological data is very useful for interpretation of the baseline information and for model study of air quality impacts also. Since meteorological data show wide fluctuations with time, meaningful interpretation can only be drawn from long term and reliable data. Such source of data is the Indian Meteorological Department (IMD), which maintains a network of meteorological stations at several important locations. The data recorded for IMD station at Kurnool is summarized and the salient features of the summarized data are as follows in the [Table 3.7](#).

Table 3.7 Meteorological data at IMD Station

జలవాయవి సారాణి																											
CLIMATOLOGICAL TABLE																											
స్టేషన్		అక్షాంశ		దేశాంశ		సముద్ర మట్టం నుండి ఎత్తు		స్టేషన్		పరిశీలన ఆధారితం																	
STATION		LAT.		LONG.		HEIGHT ABOVE M.S.L.		METRES		BASED ON OBSERVATIONS 1981-2010																	
		వార్షిక సగటు						అత్యధిక		అత్యంత						వర్షం											
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
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		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
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		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
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		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
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		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత				అత్యధిక		అత్యంత		24 గంటల వర్షం		అత్యధిక		సగటు	
		సగటు						అత్యధిక		అత్యంత		సగటు		అత్యంత		</											

जलवायवी सारणी CLIMATOLOGICAL TABLE																																																											
स्टेशन : कुर्दुम STATION : Karmali																																																											
प्रीत्यर्थ परिचय										वर्षा										प्रेष										दृश्यता																													
के वर्षा दिनों की संख्या										वर्षा की गति के साथ (कि. मी. प्र. घं.)										वर्षा की दिशा के दिनों की संख्या का प्रतिशत										वर्षा की गति के साथ दिनों की संख्या - अल्पमति																													
वर्षा	0-3 मि.मि.प्र. अधिक	अल्प	मध्य	अधिक	अल्प	अधिक	अल्प	अधिक	अल्प	0-1 कि. मी. प्र. घं.	1-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	0-10	10-20	20-30	30-40	40-50	50-60																							
WEATHER PHENOMENA										WIND										CLOUD										VISIBILITY																													
No. OF DAYS WITH										No. OF DAYS WITH WIND SPEED (Km. p. h.)										PERCENTAGE No. OF DAYS WIND FROM										No. OF DAYS WITH CLOUD AMOUNT (ALL CLOUDS) DATA										No. OF DAYS WITH LOW CLOUD AMOUNT DATA										No. OF DAYS WITH VISIBILITY									
MONTH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																							
जनवरी JAN	0.6	0	0.1	0.1	0	0	0	0	0	0	0	12	19	1	5	8	8	2	1	1	1	73	16	6	5	3	1	27	3	1	0	0	0	0	0	0	0																						
फरवरी FEB	0.5	0	0.1	0	0	0	0	0	0	0	0	14	14	3	2	11	15	5	4	3	3	50	16	5	3	3	0	25	2	1	0	0	0	0	0	0	0																						
मार्च MAR	1.3	0.1	1.5	0	0	0	0	0	0	0	0	19	12	2	3	10	14	8	7	6	4	45	19	6	4	2	0	27	3	1	0	0	0	0	0	0	0																						
अप्रैल APR	2.7	0	4	0	0.1	0	0	0	0	0	0	24	6	4	4	7	14	11	11	17	7	25	13	7	6	3	1	25	4	1	0	0	0	0	0	0	0																						
मई MAY	5	0	6.6	0	0	0	0	0	0	0	0	28	3	3	2	2	3	4	13	47	16	10	5	9	8	7	2	22	7	2	0	0	0	0	0	0	0																						
जून JUN	9.7	0	5.3	0	0	0	0	0	0	0	0	29	1	1	1	0	0	2	24	57	11	4	1	4	6	12	0	10	10	5	0	0	0	0	0	0	0																						
जुलाई JUL	13	0	3.5	0	0	0	0	0	0	0	0	30	1	0	0	0	0	1	26	57	9	5	0	3	7	13	0	8	10	0	1	0	0	0	0	0	0																						
अगस्त AUG	14.3	0	3.4	0	0	0	0	0	0	0	0	29	2	1	0	0	0	1	19	62	12	5	0	3	7	13	0	8	16	7	0	0	0	0	0	0	0																						
सितंबर SEP	11.8	0	5.9	0	0	0	0	0	0	0	0	28	5	2	1	0	1	1	16	46	14	30	1	5	8	11	0	10	14	6	0	0	0	0	0	0	0																						
अक्टूबर OCT	7.9	0	4	0.1	0	0	0	0	0	0	0	19	15	4	7	4	3	2	6	11	6	57	6	6	7	9	4	17	9	5	0	0	0	0	0	0	0																						
नवंबर NOV	3.7	0	0.4	0	0	0	0	0	0	0	0	14	16	5	14	6	2	1	1	2	2	67	9	7	7	6	1	23	5	2	0	0	0	0	0	0	0																						
दिसंबर DEC	0.7	0	0	0.1	0	0	0	0	0	0	0	11	20	3	8	7	5	1	1	1	0	74	13	7	5	5	1	28	2	1	0	0	0	0	0	0	0																						
वर्षा की औसत ANNUAL TOTAL OR MEAN	71.2	0.1	34.6	0.2	0.1	0	0	0	0	0	1	251	113	2	4	4	5	9	11	27	7	37	103	99	74	98	96	228	66	39	2	0	0	0	0	0	0																						
वर्षा की औसत NUMBER OF YEARS	30									30										30								30									30																						

3.4.2 Meteorological Station at Plant Site

The micro meteorological data at the industry site is collected simultaneously with ambient air quality monitoring. The station was installed at height of 10 meters above the ground level and the same is located in such a way that there are no obstructions facilitating free flow of wind. Wind speed, wind direction, humidity, temperature and rainfall are recorded on hourly basis. Salient features of micro meteorological data collected are as follows:

1. Wind Direction and Speed:

The hourly wind speed and wind direction observations are computed during various seasons of study period and the same are presented in [Table 3.8](#) and the wind rose diagrams are presented in [Figure 3.9](#). The following observations can be made from the collected data;

- Calm period is observed to be 1.34 % during the time of monitoring.
- The predominant wind direction is east.
- Other than predominant wind directions wind was blowing in East –northeast and west.
- Mostly the wind speeds are observed to be in the range of 5-10 kmph and 10-15 kmph.

2. Temperature: (a) Maximum: 38.6 °C (b) Minimum: 16.8 °C (c) Average: 24.4 °C

3. Humidity: The daily relative humidity values are observed to range between 26 - 84%.

4. Rain Fall: (a) Maximum: 5.2 mm (b) Minimum: 0 mm (c) Mean: 0.6 mm

Table 3.8 Frequency Distribution of Wind Speeds and Wind Directions

Wind Direction	Wind Speed in kmph					
	Calm	1 - 5	5-10	10-15	>15	Total
N		1.90	1.81	0.23	0.05	3.98
NNE		2.04	2.45	0.95	0.44	5.88
NE		2.55	3.01	2.04	0.37	7.96
ENE		2.92	4.58	2.87	0.51	10.88
E		2.18	4.72	5.14	1.99	14.03
ESE		1.39	2.80	3.33	1.02	8.54
SE		1.97	3.19	2.62	0.95	8.73
SSE		1.48	1.50	0.95	0.21	4.14
S		1.11	0.79	0.74		2.64
SSW		1.11	1.20	0.28		2.59
SW		0.56	1.62	0.88	0.19	3.24
WSW		1.34	2.13	2.87	0.69	7.04
W		1.78	4.31	2.85	0.39	9.33
WNW		1.48	2.75	1.57	0.56	6.37
NW		0.56	0.58	0.32	0.14	1.60
NNW		0.97	0.46	0.28		1.71
CALM	1.34					1.34
Total	1.34	25.32	37.92	27.92	7.50	100.00

Monitoring Period: December 2016 – February 2017

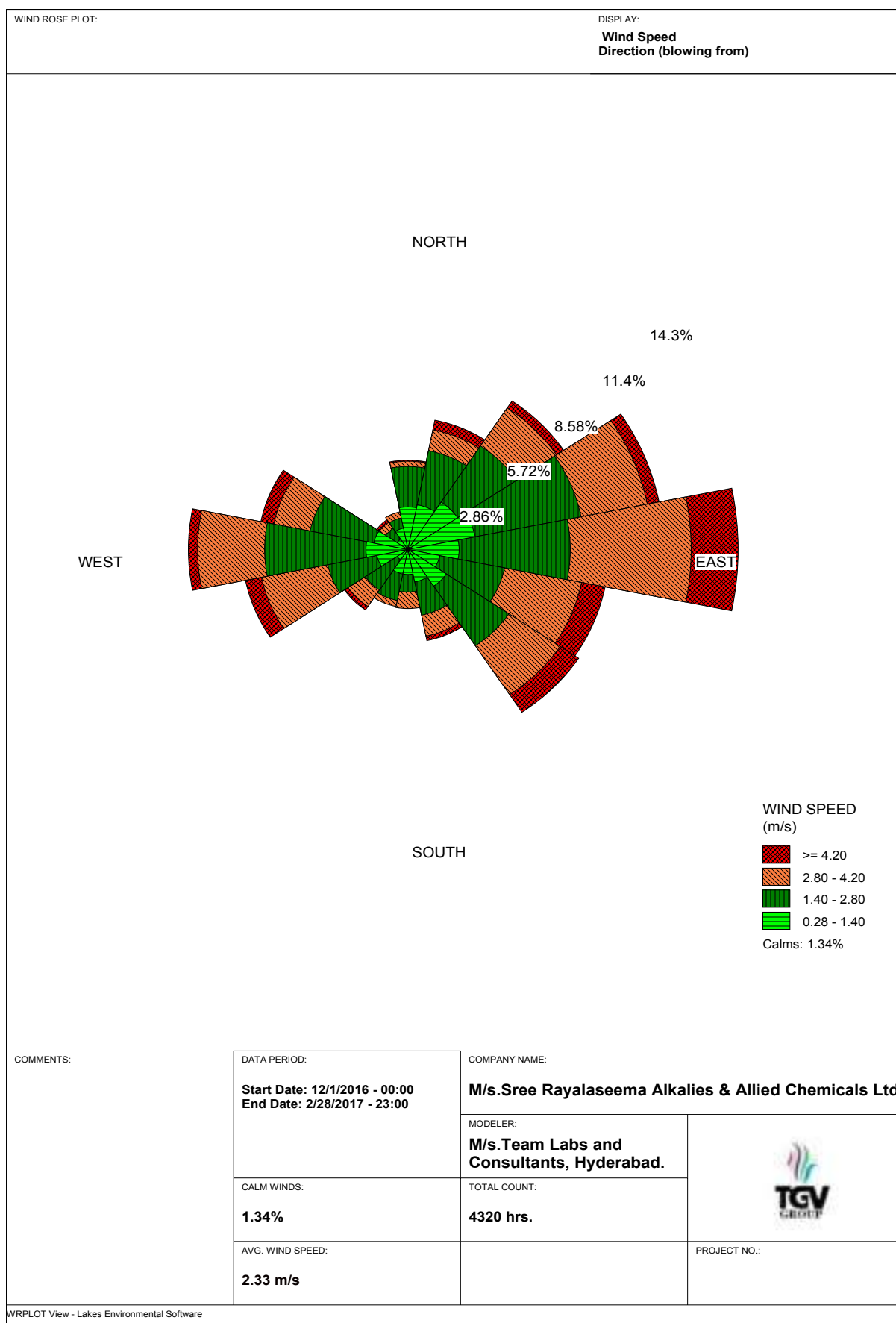


Figure 3.9 Wind Rose Diagram at Site

3.4.3 Ambient Air Quality *(Terms of Reference No. 6(ii))*

Air pollution means the presence in the outdoor atmosphere of one or more or combinations thereof in such quantities and of such duration as are or may tend to be injurious to human, plant or animal life or property. Air pollutants include smoke, vapors, soot, fumes, gases, mist, odors, particulate matter, radioactive material or noxious chemicals. With upcoming industrial activity a range of different pollutants are released into the atmosphere that are dispersed and have a significant impact on neighborhood air environment. Thus collection of base line data of air environment occupies a predominant role in the impact assessment. The ambient air quality status across the study zone forms basis for prediction of the impacts due to the proposed project.

The data required to assess air quality impacts in and around neighborhood is achieved by designing such a network, which encompasses micro meteorological conditions, quantity and quality of emissions, locations, during, resources / monitoring technology and operational criteria.

3.4.4 Scope of Field Study

The scope of baseline status of the ambient air quality can be assessed through a well-designed ambient air quality stations network. Ambient air quality monitoring of the study area consisting of 10km radius with the Plant site as the center point was carried out during the study period. Ambient air quality was monitored at eight locations spread over entire study area. [Figure 3.11](#) presents the locations of eight ambient air quality-monitoring stations. At each sampling station monitoring was carried out for 24 hours in a day for 2 days a week, and for three months. The major air pollutants monitored on 24 hourly basis are; PM₁₀, PM_{2.5}, Sulfur dioxide and Oxides of Nitrogen. The other parameters analysed are the remaining NAAQ parameters. Sampling and analysis of the above variables is according to the guidelines of Central Pollution Control Board. National Ambient Air Quality Standards is presented in [Table 3.9](#).

Table 3.9 National Ambient Air Quality Standards

Pollutant	Time Weighted Average	Concentration in Ambient Air		
		IRR	ESA	Methods of Measurement
Sulphur Dioxide (SO ₂)	Annual* 24 Hours**	50 80	20 80	Improved west and Gaeke Ultraviolet fluorescence
Nitrogen Dioxide (NO ₂)	Annual* 24 Hours**	40 80	30 80	Modified Jacob & Hochheiser (Nn-Arsenite) Chemiluminescence
Particulate Matter (Size Less than 10µm) or PM ₁₀	Annual* 24 Hours**	60 100	60 100	Gravimetric TOEM Beta Attenuation
Particulate Matter (Size Less than 2.5µm) or PM _{2.5}	Annual* 24 Hours**	40 60	40 60	Gravimetric TOEM Beta Attenuation
Ozone (O ₃)	8 hours** 1 hour**	100 180	100 180	UV Photometric Chemiluminescence Chemical Method
Lead (Pb)	Annual* 24 hours**	0.50 1.0	0.50 1.0	AAS /ICP method after sampling on EPM 2000 or equivalent filter paper ED - XRF using Teflon filter.
Carbon Monoxide (CO)	8 hours** 1 hour**	02 04	02 04	Non Dispersive Infra Red Spectroscopy
Ammonia (NH ₃)	Annual* 24 hours**	100 400	100 400	Chemiluminescence Indophenol blue method
Benzene (C ₆ H ₆)	Annual*	05	05	Gas Chromatography based continuous analyzer Absorption and Desorption followed by GC analysis
Benzo (o) Pyrene(BaP) - Particulate Phase only,	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis
Arsenic (As),	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni),	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
IRR - Industrial, Residential, Rural and Other Area, ESA- Ecological Sensitive Area (Notified by Central Government)				
G.S.No.826 (E) dated 16 th November, 2009. Vide letter no. F. No. Q-15017/43/2007-CPW				
*Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform interval.				
**24 hourly/8/1 hourly monitored values as applicable, shall be complied with 98 percent of the time in a year.2% of time they may be exceeded the limits but not on two consecutive days of monitoring.				

3.4.5 Description of Sampling Locations

The location of ambient air quality stations is contingent on the meteorological status of the area. Hence the micro meteorological data was collected before initiating the ambient air quality monitoring. **Table 3.10** presents the ambient air quality locations and their distances and directions from the plant site.

Table 3.10 Locations of Ambient Air Quality Monitoring Stations

S.No	Location	Direction	Distance from Plant site (KM)
AAQ-1	SRAACL	-	-
AAQ-2	SRHHL	NE	0.2
AAQ-3	Etiavalatandrapadu	NW	0.6
AAQ-4	Gondiparla	N	1.8
AAQ-5	Basavapuram	SE	2.4
AAQ-6	Kurnool	SW	1.4
AAQ-7	Kasipur	NE	4.2
AAQ-8	Devamada	SE	5.8
AAQ-9	Munagalapadu	NW	6.4

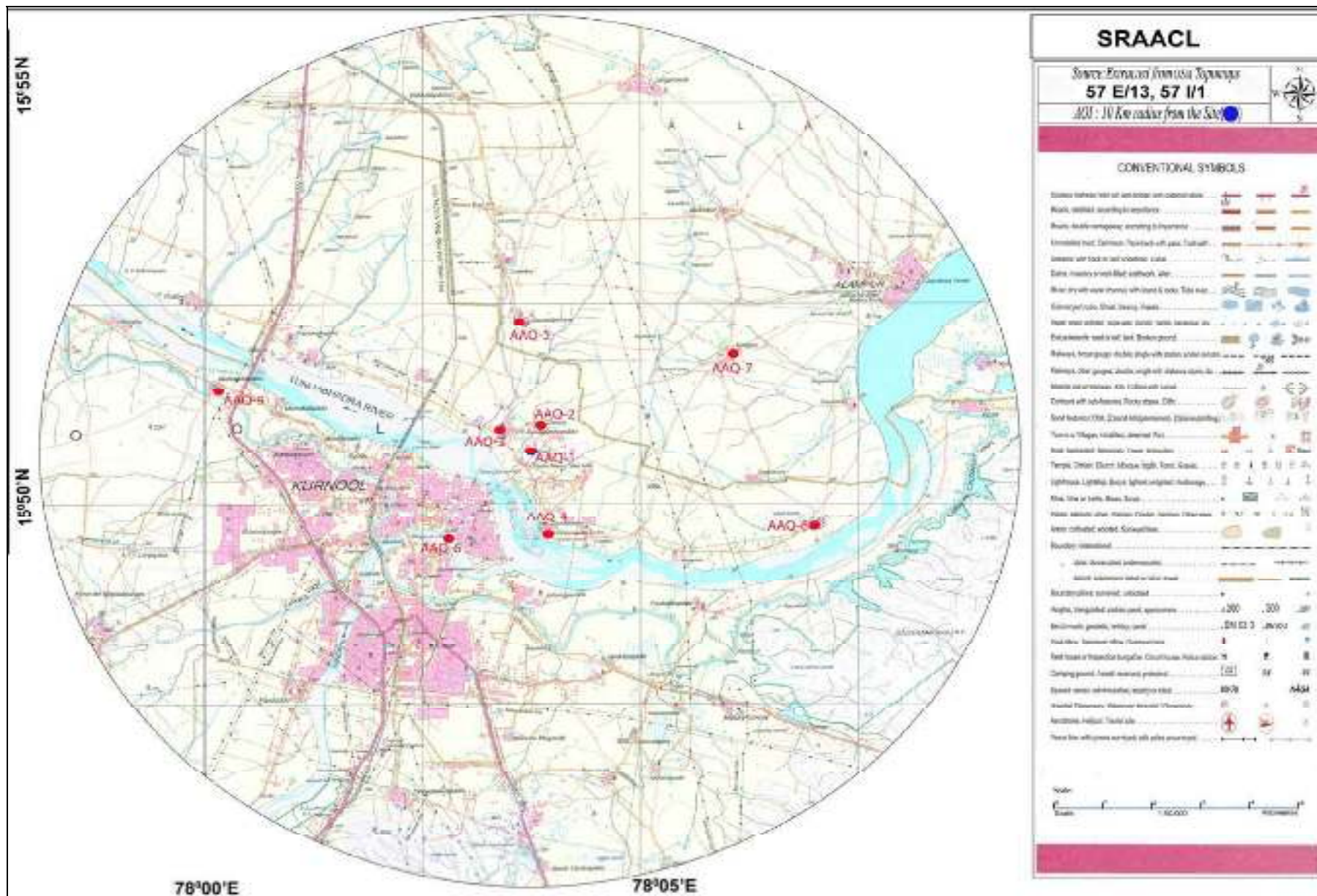


Figure 3.10 Ambient Air Quality Monitoring Locations

3.4.6 Ambient Air Quality Status (Terms of Reference No. B. 9 & A. 19)

The baseline data for ambient air quality is presented in **Table 3.11**. It may be noted that the monitoring values for VOC except plant area is below detectable limits. The observed values are found to be within the prescribed NAAQ standards. Graphical representation of ambient air quality is presented in **Fig 3.11**.

Table 3.11 Summary Ambient Air Quality Status (Terms of Reference No. 6(iii))

Pollutant	Maximum	Minimum	Mean	98 Percentile
1) Location: SRAACL				
PM ₁₀	56	41	48.42	56
PM _{2.5}	26	21	23.88	26
SO ₂	16	11	13.35	16
NO _x	16	11	13.54	16
VOC (in PPM)	4.9	0.3	2.6	4.9
HCl	2.2	0.9	1.5	2.2
2) Location: SRHHL				
PM ₁₀	56	41	47.50	56
PM _{2.5}	26	21	24.35	26
SO ₂	16	11	13.27	16
NO _x	16	11	13.42	16
VOC (in PPM)	4.8	0.3	2.5	4.6
HCl	2.1	0.9	1.4	2.1
3) Location: Etiavalatandrapadu				
PM ₁₀	54	41	47.31	53
PM _{2.5}	24	16	20.08	24
SO ₂	14	10	11.96	14
NO _x	14	10	12.08	14
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
4) Location: Gondiparla				
PM ₁₀	48	36	41.08	48
PM _{2.5}	22	14	18.12	22
SO ₂	12	9	10.65	12
NO _x	12	9	10.58	12
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
5) Location: Basavapuram				
PM ₁₀	48	36	43.31	48
PM _{2.5}	19	14	17.12	19
SO ₂	12	9	10.42	12
NO _x	12	9	10.65	12
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
6) Location: Kurnool				
PM ₁₀	56	44	49.65	56
PM _{2.5}	26	21	24.23	26
SO ₂	16	11	13.77	16

Pollutant	Maximum	Minimum	Mean	98 Percentile
NO _x	16	11	14.73	16
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
7) Location: Kasipur				
PM ₁₀	46	32	40.08	46
PM _{2.5}	19	16	17.77	19
SO ₂	12	9	10.27	12
NO _x	11	9	9.77	11
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
8) Location: Devamada				
PM ₁₀	46	31	38.42	46
PM _{2.5}	19	14	17.15	19
SO ₂	12	9	9.85	12
NO _x	13	9	10.42	13
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL
9) Location: Munagalapadu				
PM ₁₀	39	31	35.85	39
PM _{2.5}	22	16	18.81	22
SO ₂	12	9	10.31	12
NO _x	13	9	11.08	13
VOC (in PPM)	BDL	BDL	BDL	BDL
HCl	BDL	BDL	BDL	BDL

- Note: Pollutant concentrations are presented in $\mu\text{g}/\text{m}^3$
- BDL: Below detectable limit
- VOC Monitoring Instrument: Photo Ionization Detector (Phocheck - Tiger S.No. T-105493)

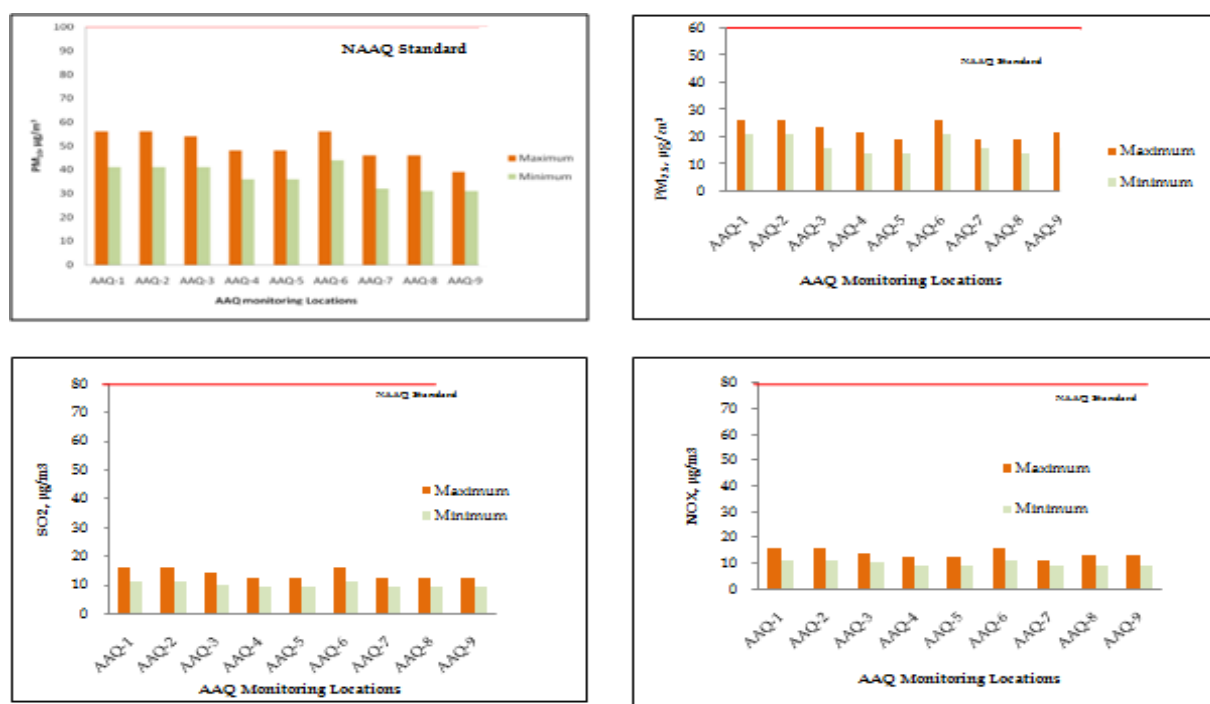


Fig 3.11 Graphs Showing the Results of Ambient Air Quality

3.4.7 Noise Environment *(Terms of Reference No. 6(vii))*

Noise is an unwanted sound without musical quality. Artificial noise and its impact on environment, grown apace with advancing human civilization. Noise pollution is equally hazardous to environment as air, water and other forms of pollution. Various noise measurement units have been introduced to describe, in a single number, the response of an average human to a complex sound made up of various frequencies at different loudness levels. The most common scale is, weighted decibel dB (A), and measured as the relative intensity level of one sound with respect to another sound (reference sound).

The impact of noise depends on its characteristics (instantaneous, intermittent or continuous in nature), time of day (day or night) and location of noise source. **Table 3.12** shows the effects of different noise levels on human beings. The environmental impact of noise can have several effects varying from noise induced hearing loss to annoying depending on noise levels.

The assessment of noise pollution on neighborhood environment due to the proposed plant area was carried out keeping in view, all the considerations mentioned above. The existing status of noise levels is measured at 9 locations at various villages within the study area. **Figure 3.12** presents noise level monitoring locations. The monitored noise levels are shown in **Table 3.13**. Noise levels are observed to be within the prescribed limits of rural and residential areas.



Table 3.12 Effects on Human Beings at Different Noise Levels

Source	Noise Level B(A)	Effects
Large Rocket Engine (near by)	180	Threshold of Pains
Hydraulic Press (1 m)	130	
Jet take off (60 m)	120	Maximum vocal effort possible
Automobile Horn (1m)	120	
Construction Noise (3m)	110	
Jet Take off (600 m)	110	
Shout, Punch, Press, Circular Saw	100	Very annoying
Heavy Truck (15m), Farm Machinery	90	Prolonged exposure Endangers Lathes, Sports Car, Noisy Machines hearing loss
Automobile (15m)	80	Annoying
Freeway Traffic (15m)	70	Telephone is difficult, intrusive
Loud Conversations	60	
Living Room in Home	50	Quiet
Power Station (15m)	50	
Bed Room in Home	40	
Soft Whisper (5m)	30	Very quiet
Tick of Wall clock (1m)	30	
Low radio Reception	20	
Whisper	20	
Rattling of Leaves by Breeze	10	Barely audible
	0	Threshold of hearing

Table 3.13 Equivalent Noise levels in the Study Area

S.No.	Location	Equivalent Noise Levels dB(A)	
		Leq _{day}	Leq _{night}
1.	SRAACL	56	42
2.	SRHHL	54	42
3.	Etiavalatandrapadu	49	36
4.	Gondiparla	51	35
5.	Basavapuram	46	36
6.	Kurnool	57	41
7.	Kasipur	49	34
8.	Devamada	47	36
9.	Munagalapadu	47	36

3.4.8 Traffic Study

Traffic study was conducted during three alternative days including a holiday to arrive at peak traffic hours. Peak traffic was observed during 8 – 9 AM and 6 – 7 PM consisting of mainly passengers traffic. Graphical representation of peak traffic is presented in [Fig 3.13](#).

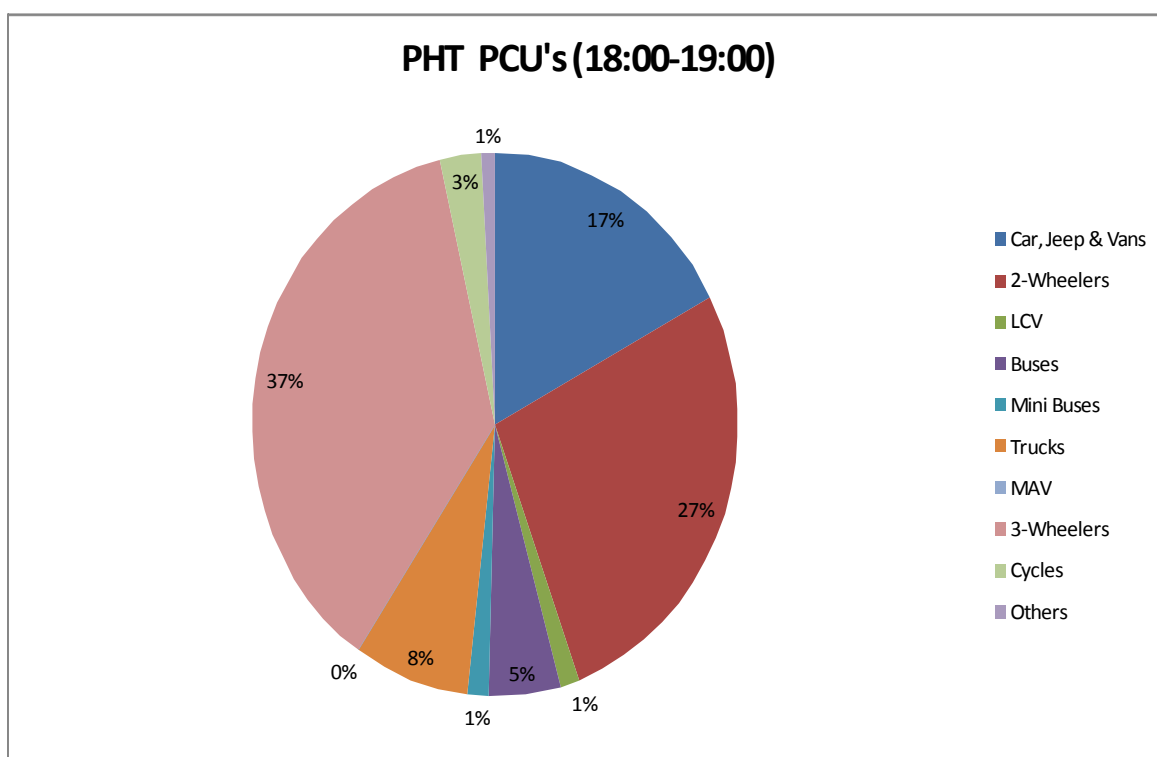
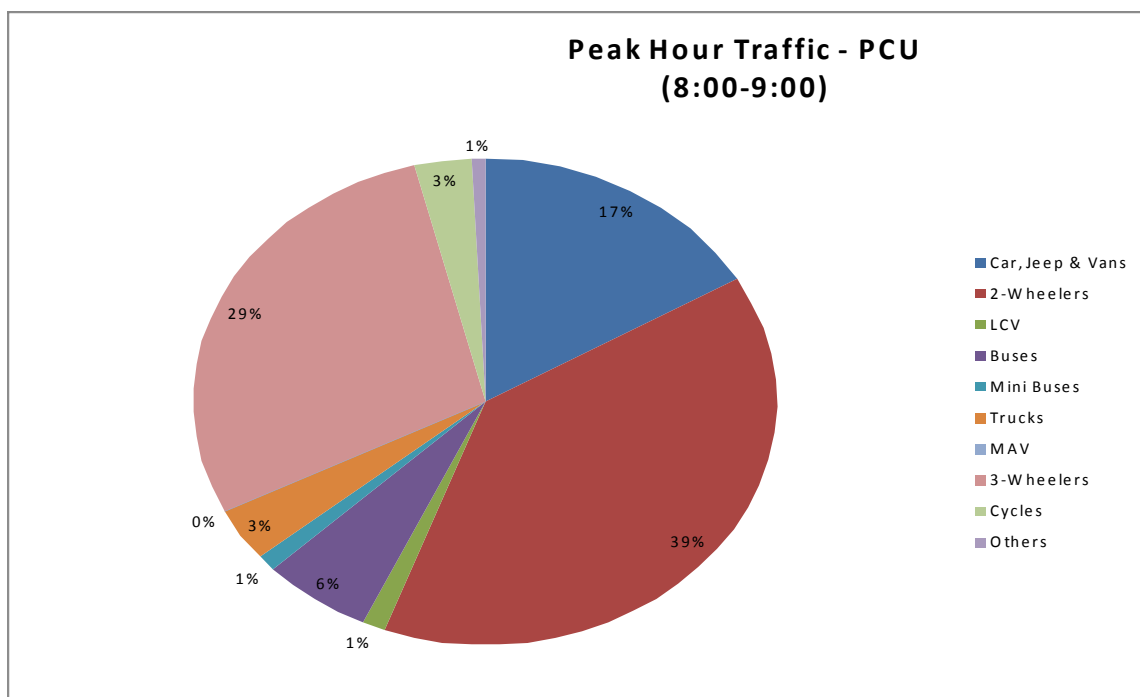


Figure 3.13 Peak Hour Traffic

3.5 Socio Economic Environment *(Terms of Reference No. 6(xi))*

Industrial development reflects in social development, i.e., growth in infrastructure facilities, growth in employment rates, increased demands for housing, and other amenities etc., which will have a bearing on the socio economic status.

Socio-economic survey is conducted to ascertain the existing socio-economic status to compare the same with the developments due to the project. Baseline data of demographic characteristics- occupational status, literacy, health status and the access to infrastructure facilities for social development in the project area has been studied from the secondary data collected from census department By M/s. Team Labs and Consultants.

Demographic characteristics of the study area falling within 10 km radius of the project site have been compiled to assess the pre-project socio-economic status. Secondary data has been collected from various government agencies i.e., chief planning officer, Kurnool district and other government departments of forestry, irrigation etc., and Mandal Development Offices of the relevant government departments. Census 2011 was complied and presented as follows

3.6 Demography

The study area falls under the following mandals of Kurnool district; Kurnool, Kallur in Andhra Pradesh and Mahbaunagar district; Alampur, Manopadu in Telangana State. Study area comprises of 23 revenue villages and 6 hamlets apart from Kurnool Municipality.

3.6.1 Population Distribution

The population distribution of the study area is presented in [Table 3.14](#). The population density in the study area is less reflecting the rural nature and lack of irrigation facilities. The total population of the area is 676115 consisting of 338221 males and 337894 females. The population density in this area reflects the rural area. The population of the scheduled castes is 113122 consisting of 55490 males and 57632 females, while the scheduled tribe population is 7441 consisting of 3702 males and 3739 females, which is 16.73 and 1.10% of the total population respectively.

Table 3.14 Population Distribution - Study Area

Category	km				Total
	0-3	3-5	5-7	7-10	
Total Population	145381	153040	351061	26633	676115
Total Population - Male	72796	76699	174930	13796	338221
Total Population - Female	72585	76341	176131	12837	337894
Population <6 years	16852	17818	39615	3179	77464

Male <6 years	8725	9251	20524	1637	40137
Females < 6years	8127	8567	19091	1542	37327
Scheduled Caste Population	21607	23602	61132	6781	113122
Male - SC	10677	11762	29628	3423	55490
Female - SC	10930	11840	31504	3358	57632
Scheduled Tribe Population	2070	2115	3151	105	7441
Male - ST	1046	1072	1519	65	3702
Female - ST	1024	1043	1632	40	3739

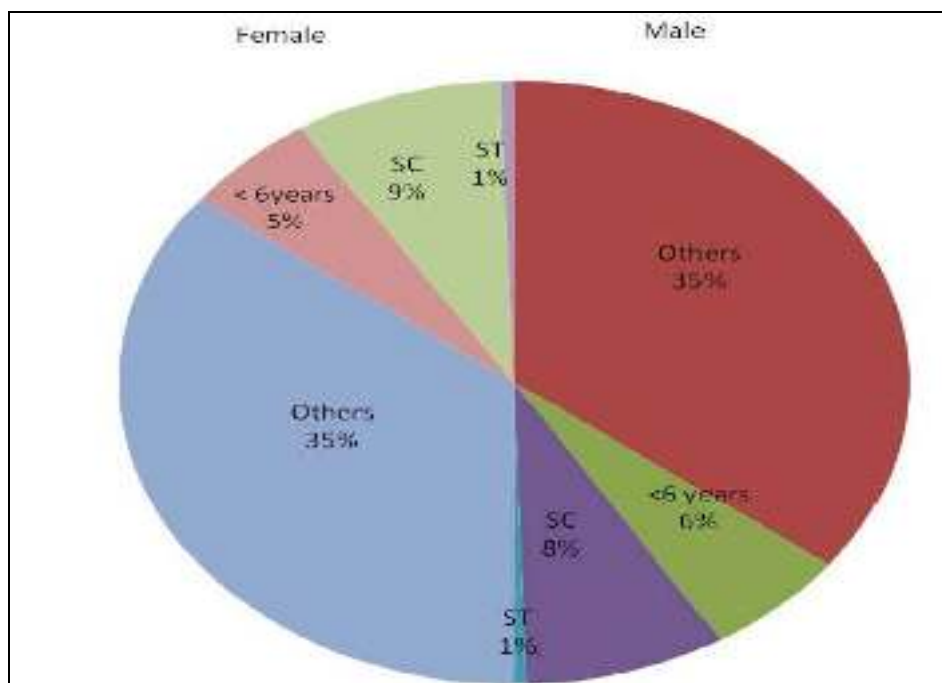


Figure 3.14 Population distribution of the Study Area

3.6.1.1 Literacy

Census operations consider a literate as a person who is above six years old and who can write and read as per the census. [Table 3.15](#) presents the literacy levels in the study area. The population below six years old is 77464 consisting of 40137 males and 37327 females, which is 11.46% of the study area population. The percentage of literacy level in the study area among males is 81.81 and 68.40 among females. It may be observed that the literacy level among females is comparatively less than males.

Table 3.15 Literacy Study Area

Category	km				Total
	0-3	3-5	5-7	7-10	
Total Population	145381	153040	351061	26633	676115
Total Population - Male	72796	76699	174930	13796	338221
Total Population - Female	72585	76341	176131	12837	337894
Population <6 years	16852	17818	39615	3179	77464

Male <6 years	8725	9251	20524	1637	40137
Females < 6years	8127	8567	19091	1542	37327
Total Literates	96639	100192	237678	14925	449434
Male -Literates	52940	55201	126770	8937	243848
Female - Literates	43699	44991	110908	5988	205586
Total Illiterates	48742	52848	113383	11708	226681
Male -Illiterate	19856	21498	48160	4859	94373
Female - Illiterate	28886	31350	65223	6849	132308

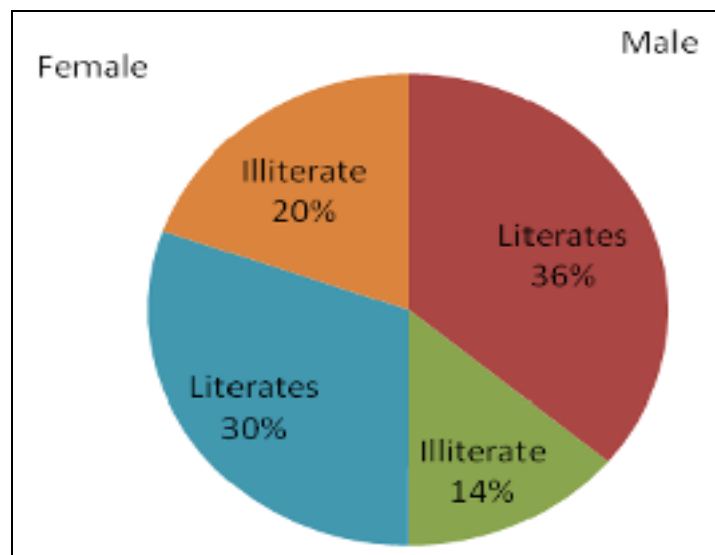


Figure 3.15 Literacy of Study Area

3.6.1.2 Employment/Occupation

Work is defined as participation in any economically productive activity – Physical/ mental. The work force is classified into three categories: a) main workers, b) marginal workers and c) non-workers. Main workers are those who work for a substantial part of the year for a living such as salaried employees, agricultural labor etc. Marginal workers are those who worked the previous year but have not worked for a substantial part of this year. Non-workers constitute students, house wives, dependents, pensioners etc. **Table 3.16** presents the population distribution for employment.

It may be observed that a majority of the study area population falls in the non worker category among 61.07 % of the total population and the marginal workers from about 5.2% of the total population. The male female difference is also significant in all the regions and in all the categories. There are few females among the workers where as there are more non workers and marginal workers among females.

Table 3.16 Employment - Study Area

Category	km				Total
	0-3	3-5	5-7	7-10	
Total Population	145381	153040	351061	26633	676115
Total Population – Male	72796	76699	174930	13796	338221
Total Population – Female	72585	76341	176131	12837	337894
Total Workers	58250	62132	130175	12653	263210
Total Workers – Male	39278	41462	92316	7036	180092
Total Workers – Female	18972	20670	37859	5617	83118
Total Main Workers	49356	52555	115427	10906	228244
Main workers – Male	35288	37229	84843	6189	163549
Main Workers – Female	14068	15326	30584	4717	64695
Total Marginal Workers	8894	9577	14748	1747	34966
Marginal Workers – Male	3990	4233	7473	847	16543
Marginal Workers – Female	4904	5344	7275	900	18423
Total Non Workers	87131	90908	220886	13980	412905
Non Workers – Male	33518	35237	82614	6760	158129
Non Workers – Female	53613	55671	138272	7220	254776

The main workers are further classified into; Total cultivators: those who engage a single worker or his family member to cultivate land for payment in money, kind or share; Agricultural labor : those who work in other's lands for wages; household workers: workers involved in manufacturing and processing industries in the house hold industries; and other services; Livestock, forestry, fishing and allied activities; Workers involved in mining and quarrying; Workers involved in manufacturing and processing industries in the house hold industries; non house hold industries; construction workers; workers in trade and commerce; workers involved in transport, storage and communication ; and other services: government employees, teachers, priests, artists etc. [Table 3.17](#) presents the main workers distribution among the study area population. It may be observed that over 0.89% of the study area population is involved in cultivation or agriculture labor, followed by other services to the tune of 26.74% which is largely due to the proximity to Kurnool town. It may also be observed that the people involved in non household industry are significantly more reflecting on the industrial nature of the area. Significant differences are observed among the male and female workers, Female workers are found to be more in agricultural activity largely due to more percentage of females being agricultural labor.

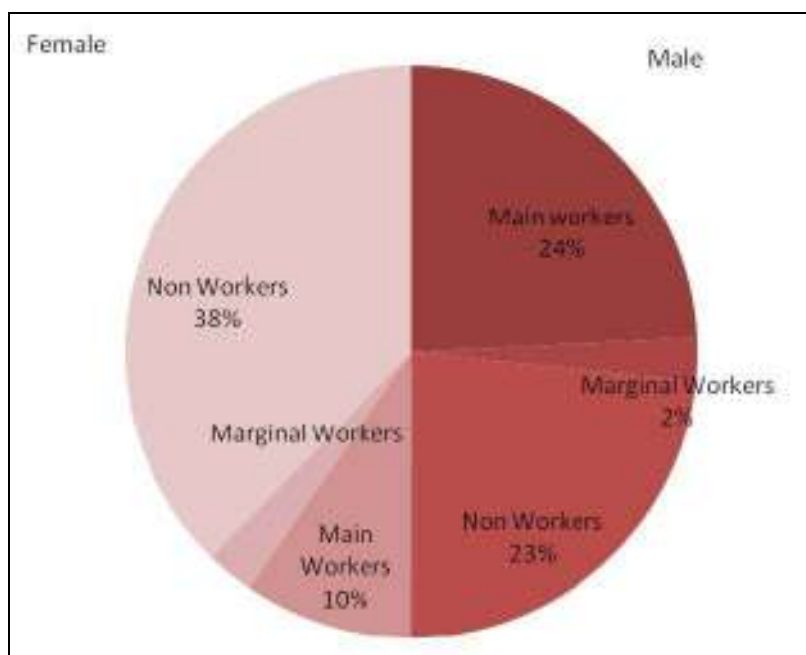


Figure 3.16 Employment - Study Area

Table 3.17 Main workers Study Area

Category	km				Total
	0-3	3-5	5-7	7-10	
Total Population	145381	153040	351061	26633	676115
Total Population – Male	72796	76699	174930	13796	338221
Total Population – Female	72585	76341	176131	12837	337894
Total Main Workers	49356	52555	115427	10906	228244
Main workers – Male	35288	37229	84843	6189	163549
Main Workers – Female	14068	15326	30584	4717	64695
Total Cultivators	868	2117	1624	1409	6018
Cultivators – Male	725	1531	1220	996	4472
Cultivators- Female	143	586	404	413	1546
Total Agriculture Labor	6679	7723	9107	6389	29898
Agriculture Labor – Male	3412	3986	4513	2909	14820
Agriculture Labor – Female	3267	3737	4594	3480	15078
Total Household Workers	1977	1954	7330	295	11556
Household Workers – Male	1094	1075	3221	134	5524
Household Workers – Female	883	879	4109	161	6032
Total Others	39832	40761	97366	2813	180772
Others – Male	30057	30637	75889	2150	138733
Others – Female	9775	10124	21477	663	42039

3.6.1.3 Living Standards and Infrastructure

Sustainable development of any area is dependent not only the population but also on the availability of infrastructure which leads to better living standards. The infrastructure facilities are essential in providing education, awareness, health, communication, potable water, transport etc. The standards of living are the sum of the

availability of the infrastructure to the subject community, wide variations in terms of income, economic conditions and patterns of spending.

The infrastructure facilities available in the impact zone are reflecting the rural nature of the entire study area.

I. Educational Facilities

The educational facilities available in the rural areas are meager, despite the proximity to urban area of Kurnool. There are 20 primary schools, 11 middle schools and 6 high schools in the study area. There is one junior college in the area. Five of the villages in the study area do not have any educational facilities. The higher educational need of the population is met by Kurnool, which has a number of engineering colleges, PG colleges, Junior colleges and degree colleges, apart from a medical colleges and Rayalaseema University. The district capital Kurnool caters to the educational needs of surrounding areas as far as 70 kms away from Kurnool.

II. Health facilities

The medical and health facilities available in the impact zone are inadequate; there are one PHC, Two PHS and no child welfare centers and 1 RP centre in the entire area. The health needs of the population in this area are met by quacks and other semi qualified persons.

III. Availability of Potable Water

The entire population in this area is dependent on ground water for drinking purposes. There are no protected water supply schemes in all the villages except in 3 villages. About 14 villages in the study area are dependent on tube wells, while the remaining villages are dependent on wells and hand pumps.

IV. Transport and Communication

Transport is essentially provided by the Andhra Pradesh State Road Transport Corporation (APSRTC). Most of the study area has excellent road network in all the villages except in one village, which has kacha roads. APSRTC bus facility is available for the all the villages. However it is observed that a number of private transport vehicles are observed in the area connecting them to Kurnool.

V. Sources of Energy and Availability

The primary source of energy in the study area is electricity, and the entire study area has electricity for agriculture and domestic purpose. The urban areas have LPG facility for their cooking purpose. A significant number of people in the urban area are also dependent on Kerosene for cooking purposes, which is contingent on the vagaries of public distribution system. A majority of the rural area is mostly dependent on Kerosene, dried cow dung cakes, wood from roadside trees for their domestic energy needs.

VI. Post and Telegraph facilities

There are 12 post offices in the area and one post and Telegraph office in the study area. Phone facilities however are extended to some of the villages.

VII. Housing

Census defines the house hold as a group of persons living together and sharing their meals from a common kitchen. The number of households in the impact zone is 149551, while the number of the houses is 156250. The density of the households is approximately five. The traditional houses made up of mud walls and covered by dry common grass and leaves of bourses are commonly found in the rural area, which are not considered pucca houses. The government has been augmenting the housing standards by constructing housing colonies for various weaker sections of the society.

3.6.2 Land Utilization

Land use patterns can be prepared on the basis of revenue records though it is not an exact indicator of the actual use of the land at a given time. Land use is presented under the heads of area under forest cover irrigated land, area under cultivation and cultivable wasteland in [Table 3.18](#).

Table 3.18 Land Utilization Pattern

Category	km				Total Area, Ha
	0-3	3-5	5-7	7-10	
Permanent Pastures and Other Grazing Land Area	0	14.61	16	3.47	34.08
Culturable Waste Land Area	61.2			111.49	172.69
Canals Area				616	678
Barren & Un-cultivable Land Area		156.31	96.58	661.14	914.03
Wells/Tube Wells Area	52	7	152	712.69	923.69
Fallows Land other than Current Fallows Area	188	97.52	236	731.11	1252.63
Forest Area				1084	1084
Area under Non-Agricultural Uses	618	90.07	677.27	1196.62	2581.96
Area Irrigated by Source	92	7	234	1458.18	1791.18
Current Fallows Area	254	284.1	287.76	2120.66	2946.52
Net Area Sown	5138.8	954.39	2599.39	8174.51	16867.09
Total Un irrigated Land Area	5488.8	1329.01	2889.15	9568.1	19275.06
Total	11892.8	2940.01	7250.15	26437.97	48520.93

It may be observed that a majority of the study area is un-irrigated land, followed by Area not available for cultivation.

3.6.3 Project Economy

M/s. SRAACL proposes to expand manufacturing capacity of chlor-alkali and Chlormethanes with inclusion of chlorodifluoromethanes in existing site at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh.

The proposed expansion will provide additional employment to 350 nos. It will be spending approximately 90 lakhs of rupees every month on salaries providing bread and succor to 350 families additionally. The proposed project will also generate indirect employment to the locals during construction phase. The employers will contribute to the provident fund, ESI and provide facilities as per the relevant labor act.

The proximity of Kurnool town will provide access to the extensive medical facilities available apart from the ESI medical facilities to the employees and their families. An industrial Canteen is established by the company.

It may be concluded that satisfactory amenities are available for the population of the impact zone, while the amenities are available either within the village or at a minimum distance of 3 km. The area also has large tracts of waste lands which can be utilized for industrial development. The chemical complex has been contributing to the industrial growth of the area, which in turn; generates employment, and improve the infrastructure facilities of the area by strengthening the same economically.

3.7 Flora and Fauna (*Terms of Reference No. 6(x)*)

The main aim of Conservation of Biodiversity is to ensure “No Net Loss” of any biological species whether big or small. The biodiversity-related Conventions are based on the premise that further loss of biodiversity is unacceptable. Biodiversity must be conserved to ensure it survives, continuing to provide services, values and benefits for current and future generations.

3.7.1 Methodology

The study area was analyzed with GIS tools and marked around 24 sampling points by covering the various ecosystems of core and buffer zones in all the directions. A reconnaissance survey has been made randomly to observe the ecologically sensitive habitats. General Interviews were made with local people on native animals and medicinal plants used frequently.

Flora and fauna studies were carried out during summer season to assess the list of terrestrial and aquatic biodiversity occur in the core and buffer zone of project site. Only photographs were taken during the field survey and no damage is created to flora and fauna during the data collection.

Survey Types used

- Reconnaissance survey (Near Agricultural, Human habitations and Road side)
- Quadrate and Line transect method for trees, shrubs and herbs
- Belt transect method for certain faunal species and road side trees
- Point count method for birds
- Direct and indirect evidences for other faunal species

3.7.2 Flora

Quadrat method has been used for carryout the study of trees, shrubs, herbs and grasses. 20 m X 20 m Quadrates for tree species, 5 m X 5 m quadrates for shrubs and 1 m X 1 m quadrates for herbs. During belt transects, an area of 100 m X 10 m width was estimated for statistical analysis, List of floral species observed at each quadrant was documented and photographed. Species were compared with standard floras and identifying the plants need for conservation. The Importance Value Indices (IVI) of structural species was calculated as the sum of relative frequency, relative density and relative dominance. Dominance was based on canopy cover. Density was calculated as the number of individuals per hectare in case of shrubs and tree like plants. As the herbaceous species have completed life cycle and died (dried), they are not considered for quantitative analysis. Importance value indices (IVI) of different species were calculated as the sum of relative frequency, relative density and relative dominance (relative dominance was based on the percent cover). Relative values were calculated by dividing the value attained by a species by the total parametric value and multiplying with 100. Based on the IVI values, Shannon –Wiener Indices of Diversity, Simpson Index of dominance and Jaccard index of Evenness were calculated by using a computer programme called PAST.

3.7.3Fauna

A detailed study has been carried out for faunal species by direct and indirect methods. Direct sightings were made for aves, reptiles and insects and secondary data on mammals were local villagers. Scheduling of species was done according to Indian Wildlife Protection act (1972) and IUCN is done for each species and checked the REET species. No quantitative data was calculated as some species are listed through secondary source. As the animals are migratory in nature, habitats used by protected, important or sensitive species for breeding, nesting, foraging, migration are ascertained.

3.7.3.1 Field observation

It is located towards agricultural ecosystem. This area is having several trees or plantations. The flora of the core is falls under two categories depending on the current land use. Tungabhadra River runs towards the South of the Industry. Except for perennial crops of banana there was hardly any cultivation during the summer season.

But during the rainy season all seasonal crops of Paddy, Jowar, Sorghum, Maize, Sunflower, Cotton, Chillies, Tomato, Groundnut, Red gram, Green gram, Black gram, Horse gram, Chickpea, Onion as well *Chrysanthimum* is grown. There are also small plantations of Teak and orchards of Mango, Sapota, Gauva, Pomegranate, Papaya, Orange and Lime. Cultivation is dependent on rains and groundwater. Vegetation is very sparse except in inaccessible regions. The forests belong to the Southern Tropical dry deciduous type of Champion and Seth. *Bauhinia racemosa*, *Carissa spinarum*, *Euphorbia antiuorum*, *Holoptelia integrifolia* are quite abundant widely scattered in the forest areas. But the entire ground was covered by dry *Cymbopon coloratus* which acts as a fuse to spread the fire and fuel to support the fire. Hence burning during dry season is a common practice. Another common plant found on ground level is *Croton banplantianum*. There are no ecologically sensitive areas such as biosphere reserves, National Parks or wildlife Sanctuaries or other protected areas within a distance of 10 Km from the proposed project site.

3.7.3.2 Project Site Area

The project site is a private land with man-made ecosystem with good green cover. Entire area is with terrestrial vegetation is without any forest or agriculture land and it was devoid of any ecologically sensitive biological resources. There are no REET species present in the core zone. No migratory corridors or breeding grounds for faunal species present here. The proposed expansion area is a private agricultural land. Some space was allotted to raise specific plants in core zone. No special precautions are required towards conservation of faunal diversity. The common butterflies, dragonflies, birds and smaller mammals were sighted here. The most commonly seen herbs are *Cleome viscosa*, *Acheranthus aspera*, *Alternentra sissalis*, *Tridax procumbence*, *Euphorbia hirta* etc and few weeds such as *Parthenium*, *Tephrocia purpuria*, *Lucas aspecra* and *Casia uniflora*. *Prosopis* is commonly distributed throughout the region.

Within 5 km radius of impact area, there are few large trees such as Neem, *Borassus* and *Acacia nilotica*, *Ziziphus horrida*, Mesquite (*Prosopis juliflora*), *Prosopis spicigera*, *Balanites aegyptiaca*, *Phoenix sylvestris*, *Calotropis procera*, *Carissa spinarum* and *Cassia auriculata* were most widespread, abundant and dominant. In addition to the shrubs mentioned above, there are a few perennial climbers such as *Pergularia daemia*,

Sarcostemma secamone, Swallow root (*Decalepis hamiltoni*) and *Cassytha filiformis* present in the study area. A list of plant species found in the impact area is given in **Table 3.19**. The Shannon – Wiener Index of Diversity, Simpson's Index of Dominance and Pielou's Evenness index of the forest type of communities of the core area were 2.164, 0.811 and 0.863 respectively. It indicates that the species diversity was low and dominance was high.

The faunal composition generally with arboreal and semi arboreal based animals. Some very common small animals like rats, snakes, skinks and lizards are generally found here. In aves, Mynas, White headed babblers, Sparrows, Black drongo and Indian Robin are present.

Table 3.19 List of trees, shrubs, perennial climbers and grasses

Scientific name	Local /Common name	Family
<i>Acacia leucophloea</i>	Tella thumma	Mimosaceae
<i>Acacia nilotica</i>	Nalla thumma	Mimosaceae
<i>Aganosma cymosa</i>	Nalla teega	Apocynaceae
<i>Agave americana</i>	Kalabanda	Agavaceae
<i>Azadirachta indica</i>	Vepa	Meliaceae
<i>Calotropis procera</i>	Jilledu	Asclepiadaceae
<i>Cassia auriculata</i>	Tangedu	Caesalpiniaceae
<i>Cymbopogon coloratus</i>	Bodha gaddi	Poaceae
<i>Cynodon dactylon</i>	Garika gaddi	Poaceae
<i>Euphorbia antiquorum</i>	Bontha jamudu	Euphorbiaceae
<i>Euphorbia tortillis</i>	Naaga jamudu	Euphorbiaceae
<i>Pergularia daemia</i>	Dori	Asclepiadaceae
<i>Prosopis juliflora</i>	Mesquite	Mimosaceae
<i>Waltheria indica</i>	Nalla benda	Sterculiaceae
<i>Ziziphus horrida</i>	Tella regu	Rhamnaceae
<i>Ziziphus nummularia</i>	Regu	Rhamnaceae
<i>Cassia occidentalis</i>	Kasintha	Leguminosae
<i>Balanites aegyptiaca</i>		Balanitaceae
<i>Phoenix sylvestris</i>	Eetha	Arecaceae
<i>Croton bonplandianus</i>	Vana mokka	Euphorbiaceae
<i>Borassus flabellifer</i>	Thadi chettu	Arecaceae
<i>Prosopis spicigera</i>	Jammi	Mimosaceae

3.7.3.3 Impact Area

Buffer zone is mostly with human habitations. Buffer area is mainly urban environment with few aquatic bodies. Most of the region is covered with roads and residential colonies. Hence vegetative survey mainly conducted at road side for trees and near parks and other places for herbs and shrubs. There are no endangered and endemic

plants present in the buffer and core zones. There are no medicinal, timber / fuel wood, fodder and other socio-economic purposes. The faunal composition was also estimated based on the direct and indirect evidences. Relative frequency, relative density, relative dominance and the importance value indices of the structural species present in the unopened proposed project site are shown in [Table 3.20](#).

Table 3.20 List of trees, shrubs, perennial climbers and tall grasses - Impact Area

Botanical Name	Common name	Family	Habit	Status
<i>Abrus precatorius</i>	Guriginja	Fabaceae	Climber	S
<i>Abutilon crispum</i>		Malvaceae	Shrub	S
<i>Abutilon indicum</i>	Thuthuru Benda	Malvaceae	Shrub	C
<i>Acacia leucopholoea</i>	Tella tumma	Fabaceae	Tree	C
<i>Acacia sphenoccephala</i>	seemathumma	Mimosaceae	Tree	C
<i>Achrus zapota</i>	Sapota	Sapotaceae	Tree	C
<i>Achyranthes aspera</i>	Uttareni	Amaranthaceae	Herb	C
<i>Aegle marmelos</i>	Maredu	Rutaceae	Tree	C
<i>Aerva lanata</i>	Konda Pindi	Amaranthaceae	Herb	C
<i>Ageratum conyzoides</i>		Asteraceae	Herb	C
<i>Alangium salvifolium</i>	Ooduga	Allangiaceae	Tree	C
<i>Albizia amara</i>		Fabaceae	Herb	C
<i>Aloe vera</i>		Asphodelaceae	Herb	C
<i>Alternanthera sessilis</i>	Ponaganti kura	Amaranthaceae	Herb	C
<i>Amaranthus spinosus</i>		Amaranthaceae	Herb	R
<i>Anacardium occidentale</i>		Anacardiaceae	Tree	C
<i>Andrographis echinoides</i>	Noogu nelemu	Acanthaceae	Herb	C
<i>Andrographis paniculata</i>	Nela Vemu	Acanthaceae	Herb	R
<i>Anisochilus indica</i>		Lamiaceae	Herb	R
<i>Annona reticulata</i>	Ramaphalam	Annonaceae	Tree	C
<i>Annona squamosa</i>	Seetaphalam	Annonaceae	Tree	C
<i>Artocarpus integrifolia</i>		Moraceae	Shrub	C
<i>Asistasia gangetica</i>		Acanthaceae	Herb	S
<i>Asparagus racemosus</i>	Pilli tigalu	Liliaceae	Herb	C
<i>Atalantia monophylla</i>	Konda nimma	Rutaceae	Herb	R
<i>Atylosia scarabaeoides</i>		Papilionaceae	Herb	C
<i>Azadirachta indica</i>	Vepa	Meliaceae	Tree	C
<i>Bambusa arundinacea</i>	Veduru	Poaceae	Tree	C
<i>Barleria prinitis</i>		Acanthaceae	Herb	C
<i>Bauhinia purpurea</i>	Deva kanchanum	Fabaceae	Tree	C
<i>Blepharis madaraspatana</i>	Balli noraaku	Acanthaceae	Herb	S
<i>Blumea mollis</i>	Kukka pogaku	Asteraceae	Herb	C
<i>Blumea virens</i>	Adavi pogaku	Asteraceae	Herb	C
<i>Boerhaavia diffusa</i>	Atukamaamidi	Nyctaginaceae	Herb	C
<i>Boerhaavia erecta</i>		Nyctaginaceae	Herb	C
<i>Boguinevillae spectabilis</i>		Nyctaginaceae	Shrub	C
<i>Borassus flabellifer</i>	Tadi	Arecaceae	Tree	C
<i>Borreria hispida</i>	Madanaaku	Rubiaceae	Herb	C
<i>Caesalpinia pulcherrima</i>		Caesalpinaceae	Shrub	C
<i>Calotropis gigantea</i>	Tella Jilledu	Asclepiadaceae	Shrub	C

Botanical Name	Common name	Family	Habit	Status
<i>Calotropis procera</i>	Jilledu	Asclepiadaceae	Shrub	C
<i>Canavalia gladiata</i>		Fabaceae	Climber	R
<i>Canna indica</i>	Mettatamara	Cannaceae	Aquatic plant	C
<i>Capparis zeylanica</i>		Capparidaceae	Shrub	S
<i>Cardiospermum halicacabum</i>	Buddalaaku	Sapindaceae	Herb	S
<i>Cascabela thevetia</i>	<i>pachaganneru</i>	Apocynaceae	Shrub	C
<i>Cassia alata</i>		Fabaceae	Shrub	C
<i>Cassia fistula</i>	Rela	Caesalpinaceae	Tree	C
<i>Cassia occidentalis</i>	Adavi Chennangi	Fabaceae	Herb	C
<i>Cassia siamea</i>	Seema tangedu	Leguminosae	Tree	C
<i>Cassia tora</i>	Tagarisa	Fabaceae	Herb	C
<i>Casuarina equisetifolia</i>	Sarugudu	Casurinaceae	Tree	C
<i>Catharanthus roseus</i>		Apocynaceae	Herb	C
<i>Celsoia viridis</i>		Amaranthaceae	Herb	C
<i>Cieba pentandra</i>		Malvaceae	Tree	C
<i>Cipadessa baccifera</i>		Meliceae	Shrub	S
<i>Cleome gynandra</i>		Cleomaceae	Shrub	S
<i>Cleome gynandra</i>	Vaminata	Cleomaceae	Herb	C
<i>Cleome viscosa</i>	Yerri Vaminta	Cleomaceae	Herb	C
<i>Clerodendrum serratum</i>		Verbenaceae	Shrub	S
<i>Clitoria ternatea</i>	Shanka puship	Fabaceae	Herb	C
<i>Coccinea indica</i>		Cucurbitaceae	Herb	C
<i>Coccinia grandis</i>		Cucurbitaceae	Herb	C
<i>Cocculus hirsutus</i>	Dusaari	Menispermaceae	Herb	C
<i>Cocos nucifera</i>	Coconut	Arecaceae	Tree	C
<i>Colocasia esculenta</i>	Atuka tiga	Araceae	Herb	C
<i>Commelina benghalensis</i>		Commelinaceae	Herb	C
<i>Costus speciosus</i>	Kevu kanne	Costaceae	Shrub	R
<i>Crinum asiaticum</i>	Adavi ulli	Amarylloidaceae	Herb	S
<i>Cynodon dactylon</i>	Garika	Cyperaceae	Herb	C
<i>Cynoglossis tuberosa</i>		Commelinaceae	Herb	S
<i>Cyperus rotundus</i>	Tunga	Cyperaceae	Aquatic plant	S
<i>Dalbergia sissoo</i>	seesam	Fabaceae	Tree	C
<i>Datura stramonium</i>	Ummetha	Solanaceae	Shrub	C
<i>Delonix regia</i>	Sunkesula	Fabaceae	Tree	R
<i>Dendrocalamus strictus</i>	Sanna vedru	Poaceae	Herb	C
<i>Dendrophthoe falcata</i>	badanika	Loranthaceae	Herb	C
<i>Desmodium pulchellum</i>	Deyyapu mokka	Fabaceae	Tree	S
<i>Dioscorea oppositifolia</i>	Adda dumpa	Dioscoriaceae	Climber	R
<i>Dracena sp.</i>		Dracenaceae	Shrub	R
<i>Eclipta alba</i>	Gunta galijru	Asteraceae	Herb	S
<i>Eclipta prostrata</i>		Asteraceae	Herb	C
<i>Elaeis guineensis</i>	Palm oil tree	Arecaceae	Tree	S
<i>Erithrina indica</i>		Fabaceae	Tree	R
<i>Eucalyptus globulus</i>	Neelagiri thailamu	Myrtaceae	Tree	C
<i>Eupatorium odoratum</i>		Asteraceae	Shrub	C

Botanical Name	Common name	Family	Habit	Status
<i>Euphorbia caudifolium</i>		Euphorbiaceae	Shrub	C
<i>Euphorbia hirta</i>	Pachabotlu	Euphorbiaceae	Herb	C
<i>Evolvulus alsinoides</i>	Visnu krantha	Convolvulaceae	Herb	C
<i>Ficus benghalensis</i>	Marri	Moraceae	Tree	C
<i>Ficus hispida</i>		Moraceae	Tree	C
<i>Ficus religiosa</i>	Raavi	Moraceae	Tree	C
<i>Gmelina arborea</i>		Verbenaceae	Tree	S
<i>Gmelina asiatica</i>		Lamiaceae	Tree	C
<i>Gymnema sylvestre</i>	Podapatri	Asclepiadaceae	Herb	C
<i>Gymnosporia montana</i>	Danti	Verbenaceae	Shrub	S
<i>Helictres isora</i>		Sterculiaceae	Shrub	S
<i>Holarrhena antidysenterica</i>		Apocynaceae	Shrub	C
<i>Hybanthus inaequalis</i>		Violaceae	Shrub	S
<i>Hygrophila auriculata</i>		Acanthaceae	Herb	C
<i>Hyptis suaveolens</i>	Maha beera	Lamiaceae	Shrub	C
<i>Indigofera linnaei</i>		Fabaceae	Shrub	C
<i>Ipomea aquatica</i>			Aquatic plant	C
<i>Ipomea nil</i>		Convolvulaceae	Climber	S
<i>Ipomea pestigritis</i>		Convolvulaceae	Climber	C
<i>Ipomoea carnea</i>		Convolvulaceae	Shrub	C
<i>Jasminum cuspidatum</i>		Oleaceae	Shrub	C
<i>Jatropha gossypifolia</i>	adaviamudamu	Euphorbiaceae	Tree	C
<i>Justicia procumbens</i>		Acanthaceae	Herb	S
<i>Lanea coromandelica</i>		Anacardiaceae	Tree	S
<i>Lantana camara</i>	Kattera	Verbenaceae	Shrub	C
<i>Lepidagathis cristata</i>	Nakka peeti gadda	Acanthaceae	Herb	S
<i>Leucaena leucocephala</i>	Subabul	Fabaceae	Tree	C
<i>Leucas aspera</i>	Thummi	Lamiaceae	Herb	C
<i>Leucas cephalotis</i>		Lamiaceae	Herb	C
<i>Limonia acidissima</i>	Velaga	Rutaceae	Tree	R
<i>Mangifera indica</i>	Mamidi	Anacardiaceae	Tree	C
<i>Marsilea sp.</i>		Marsileaceae	Aquatic plant	C
<i>Merremia tridentata</i>		Convolvulaceae	Climber	C
<i>Millintonea hurtensis</i>		Bignoniaceae	Tree	C
<i>Mimosa pudica</i>		Mimosaceae	Herb	C
<i>Mollugo nudicaulis</i>		Aizoaceae	Herb	C
<i>Mollugo pentaphylla</i>		Aizoaceae	Herb	C
<i>Morinda tinctoria</i>		Rubiaceae	Tree	C
<i>Mucuna pruriens</i>	Dula gondi	Fabaceae	Climber	S
<i>Mullugo nudicaulis</i>		Molluginaceae	Herb	C
<i>Mytragyna parviflora</i>		Rubiaceae	Tree	S
<i>Nymphaea nouchali</i>		Nymphaeaceae	Aquatic plant	C
<i>Ochna obtusa</i>		Ochnaceae	Tree	S
<i>Ocimum canum</i>		Lamiaceae	Herb	R
<i>Oldenlandia umbellata</i>		Rubiaceae	Herb	C

Botanical Name	Common name	Family	Habit	Status
<i>Opuntia dillenii</i>	Nagajamudu	Cactaceae	Shrub	C
<i>Oxystelma esculentus</i>		Asclepiadaceae	Aquatic plant	S
<i>Parthenium hysterophorus</i>		Asteraceae	Herb	C
<i>Pavonia zeylanica</i>		Malvaceae	Herb	C
<i>Peltophorum pterocarpum</i>	Kondachinta	Caesalpinaceae	Tree	C
<i>Phoenix humilis</i>	Jitteetha	Aracaceae	Shrub	S
<i>Phyllanthus amarus</i>	Nela Usiri	Euphorbiaceae	Herb	C
<i>Physalis minima</i>		Solanaceae	Herb	C
<i>Pithecolobium dulce</i>	Seemachinta	Fabaceae	Tree	C
<i>Plumbago zeylanica</i>		Plumbaginaceae	Herb	C
<i>Plumera alba</i>		Apocynaceae	Tree	C
<i>Pongamia pinnata</i>	Kanuga	Papilionaceae	Tree	C
<i>Portulaca oleraceae</i>		Portulacaceae	Herb	C
<i>Premna tomentosa</i>	Naguru	Verbenaceae	Tree	C
<i>Prosopis chilensis</i>	Sarkaar tumma	Mimosaceae	Tree	C
<i>Prosopis julifera</i>	Sarkaru tumpa	Mimosaceae	Tree	C
<i>Psidium guajava</i>	Jaama	Rutaceae	Tree	C
<i>Pupalia lappacea</i>	Gundu Uttareni	Amaranthaceae	Herb	C
<i>Rhynchosia heynei</i>		Fabaceae	Herb	R
<i>Rhynchosia minima</i>	Adavi vulavateega	Fabaceae	Herb	S
<i>Rostellularia diffusa</i>		Acanthaceae	Herb	R
<i>Saccharum spontaneum</i>		Poaceae	Shrub	S
<i>Samanea saman</i>	Nidra ganneru	Fabaceae	Tree	C
<i>Sansevieria roxburghiana</i>		Agavaceae	Herb	R
<i>Sapindus emarginatus</i>	kunkudu	Sapindaceae	Tree	S
<i>Scoparia dulcis</i>		Scrophulariaceae	Herb	R
<i>Sida acuta</i>	Katarumannan	Malvaceae	Herb	C
<i>Sida cordata</i>	Bala	Malvaceae	Herb	C
<i>Solanum surattense</i>	Vakudu	Solanaceae	Herb	S
<i>Sphaeranthus indicus</i>	Bodataram	Asteraceae	Herb	C
<i>Straiga asiatica</i>		Scrophulariaceae	Herb	S
<i>Syzygium cumini</i>	Jinna	Myrtaceae	Tree	C
<i>Tamarindus indica</i>	Chinta	Fabaceae	Tree	C
<i>Tectona grandis</i>	Teaku	Lamiaceae	Tree	C
<i>Tephrosia purpurea</i>		Fabaceae	Herb	C
<i>Terena asiatica</i>		Rubiaceae	Shrub	S
<i>Terminalia arjuna</i>	Tella Maddi	Combretaceae	Tree	R
<i>Terminalia catappa</i>	Badam	Combretaceae	Tree	C
<i>Thevetia populina</i>		Apocynaceae	Shrub	C
<i>Toddalia asiatica</i>	Advi nimma	Rutaceae	Shrub	R
<i>Tragea involucrata</i>	Durada gondi	Euphorbiaceae	Climber	S
<i>Trianthema portulacastrum</i>		Aizoaceae	Herb	R
<i>Urena lobata</i>		Malvaceae	Herb	C
<i>Vernonia divergens</i>		Asteraceae	Herb	C
<i>Waltheria indica</i>	Nalla Benda	Sterculiaceae	Herb	C
<i>Wrightia tinctoria</i>		Apocynaceae	Tree	S
<i>Xanthium strumarium</i>		Asteraceae	Shrub	C

Botanical Name	Common name	Family	Habit	Status
<i>Ximenia americana</i>	Nakkera	Olacaceae	Shrub	S
<i>Zea maize</i>	mokkajonna	Poaceae	Herb	C
<i>Zizyphus jujuba</i>	Regu	Rhamnaceae	Tree	C
<i>Zizyphus oenoplia</i>	Pariki	Rhamnaceae	Shrub	C
C- Common, S- Sporadic, R- Rare				

CHAPTER 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS

4.1 Identification of Impacts

Identification of Impacts is one of the basic analytical steps of EIA for subsequent prediction and evaluation of impacts. Impact is a change in baseline due to interaction of a development activity with environment, or interaction of environment with development activity, or change in baseline due to a man made emergency. The proposed expansion project of SRAACL involves increasing production capacity of Chloro-alkali plant and production capacity of chloromethane plants and inclusion of organic chemicals. The expansion of capacity requires additional construction of manufacturing blocks, installation of equipment. The impacts were assessed for construction stage, operation stage and emergency cases. Initially the assessment was done to identify impacts due to the proposed development activity using net work method which mainly follows cause condition and effect relationship. The interaction of project activity on the environment was assessed by posing questions related to each aspect of project activity envisaged as part of expansion of SRAACL

4.1.1 Impact Networks

The purpose of identifying the impacts is that it aids in making appropriate decision to mitigate the adverse consequences if any. It may be pointed out that the distinction between magnitude and importance of impact should be appreciated. Thus the degree of extensiveness and scale of impacts and the consequences based on value judgments are generalized while identifying impacts; as it is imperative that the impact will normally lead to a chain of reactions. The construction of network charts brings out to certain extent the appropriate levels of risks that may occur due to the interventions while interacting with hydrological, biological and social systems. [Figure 4.1 to 4.6](#) present the identified impacts for various components of environment viz. air, noise, water, land and socio economic aspects. In the above-mentioned Figure the lines mean -- "has an effect on."

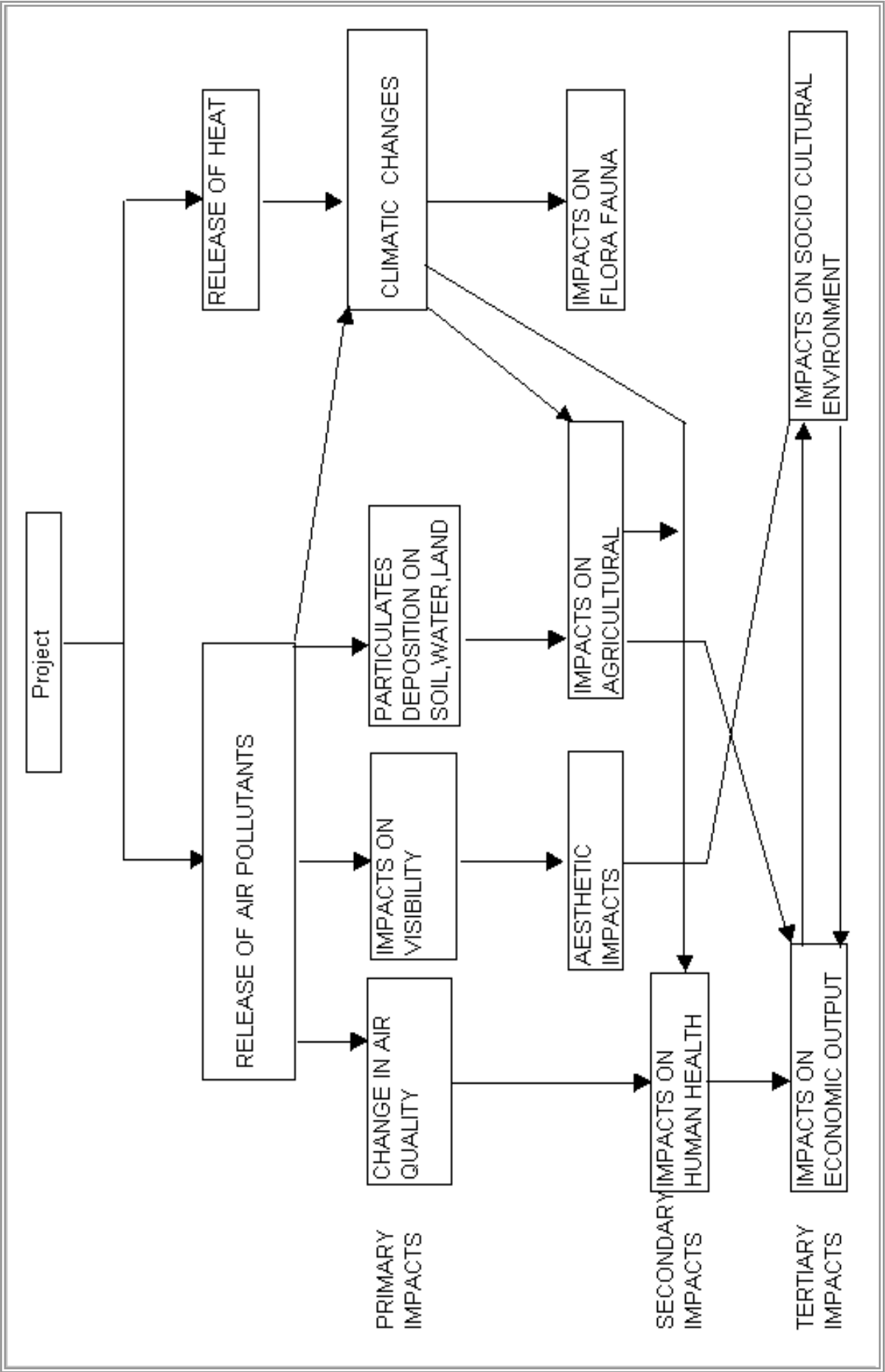


Figure 4.1 Impacts Network For Air Environment

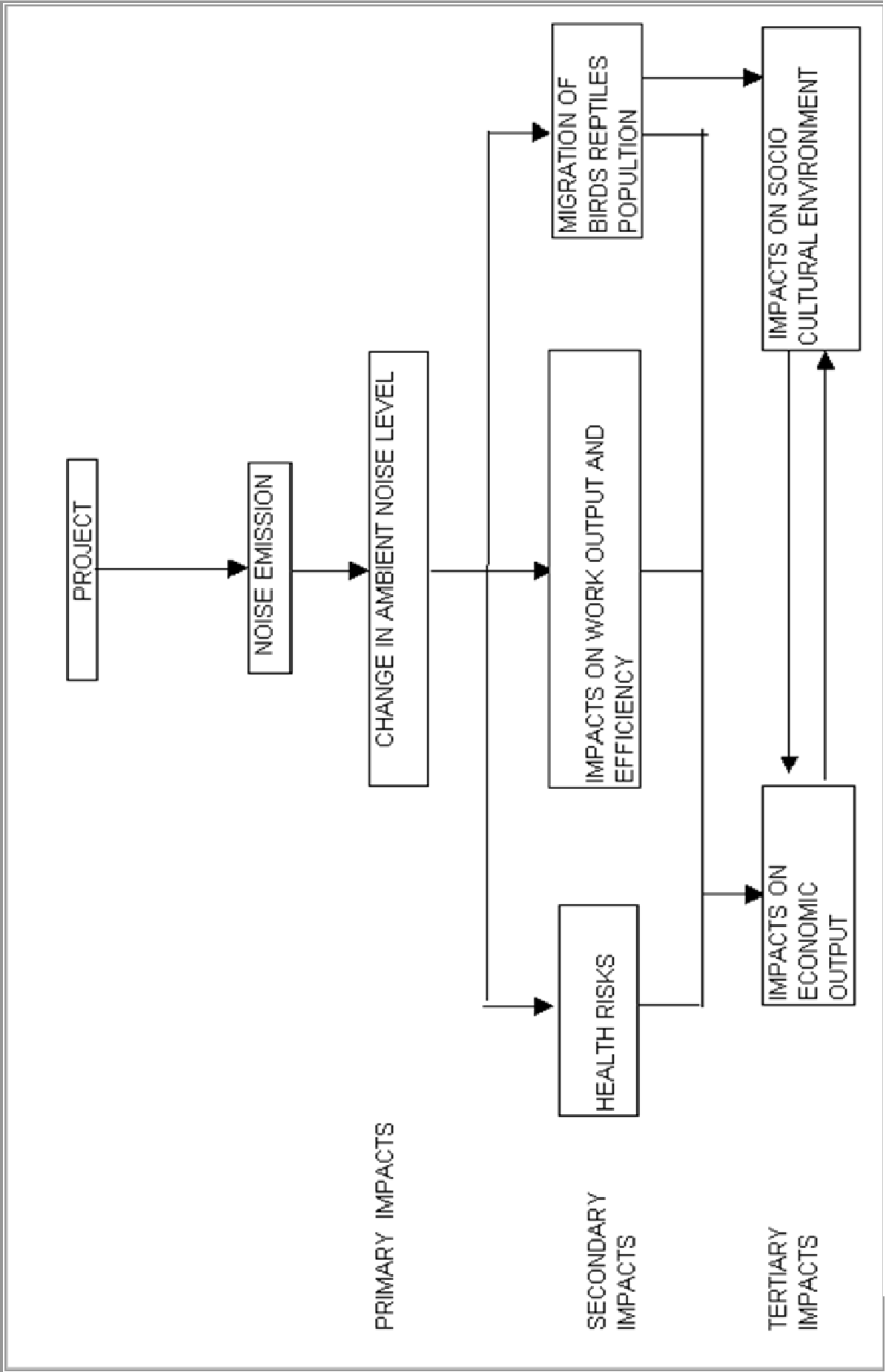


Figure 4.2 Impacts Network For Noise Environment

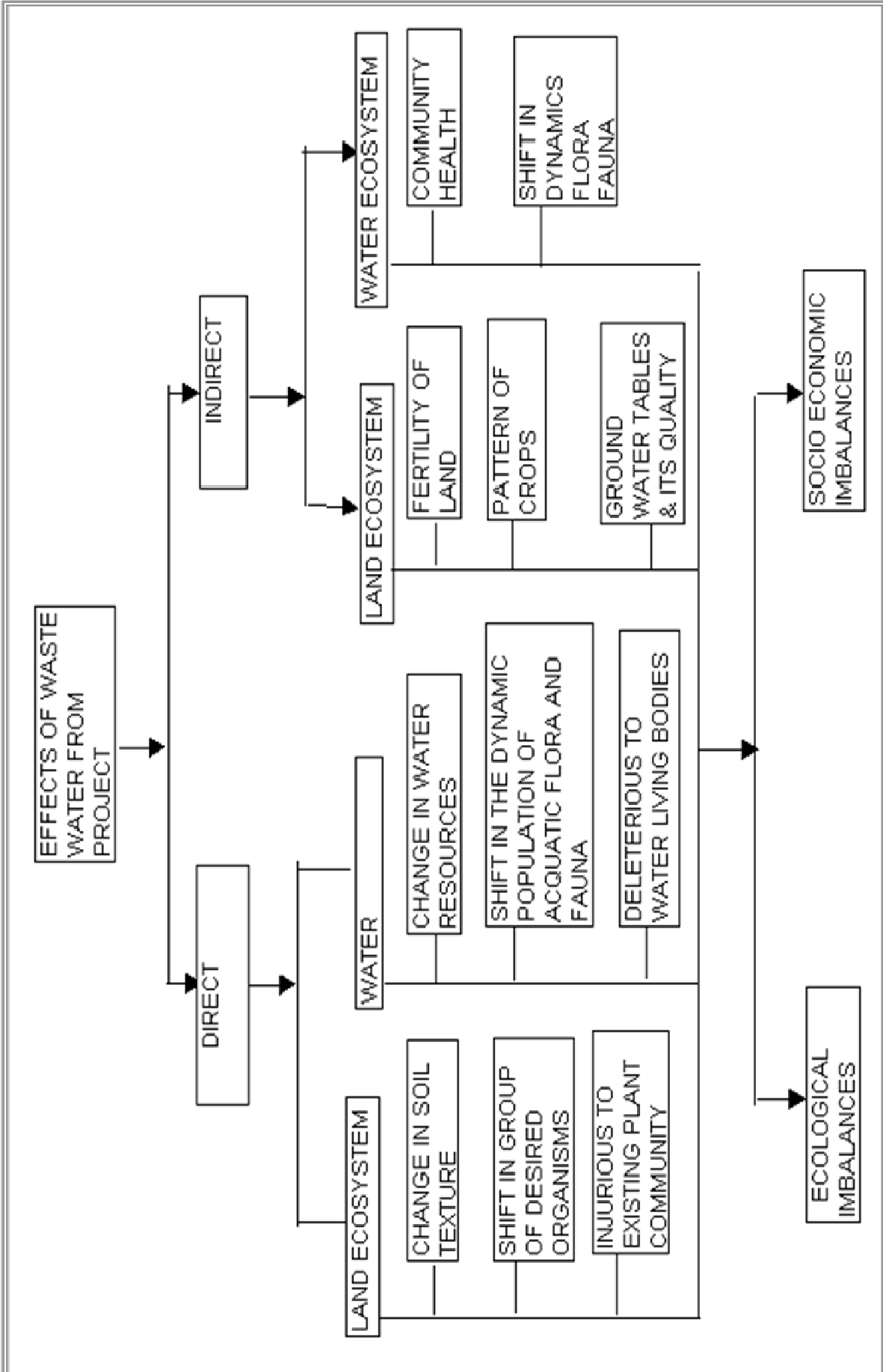


Figure 4.3 Identification of Likely Impacts for Waste Water

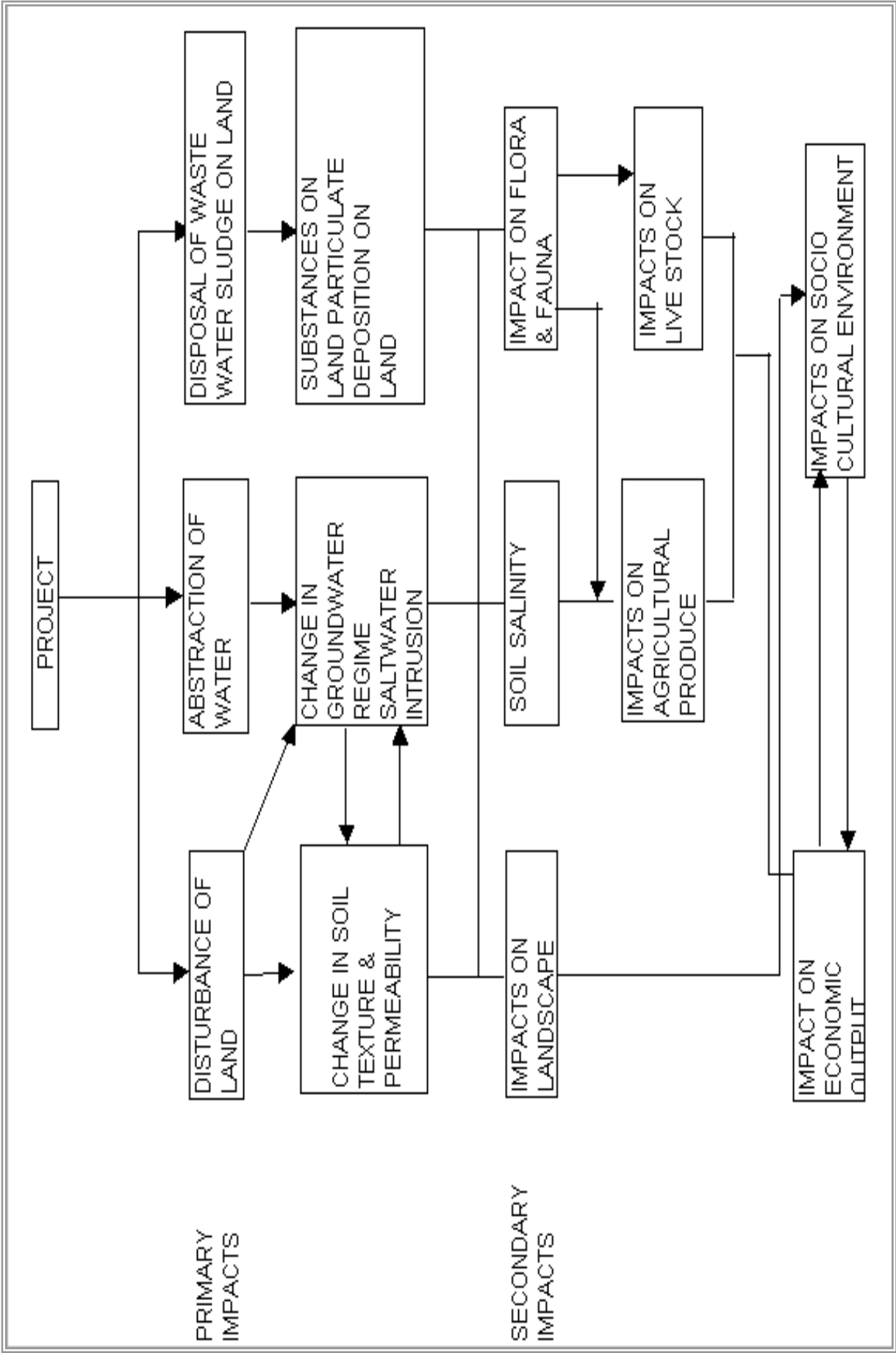


Figure 4.4 Impacts Network For Land Environment

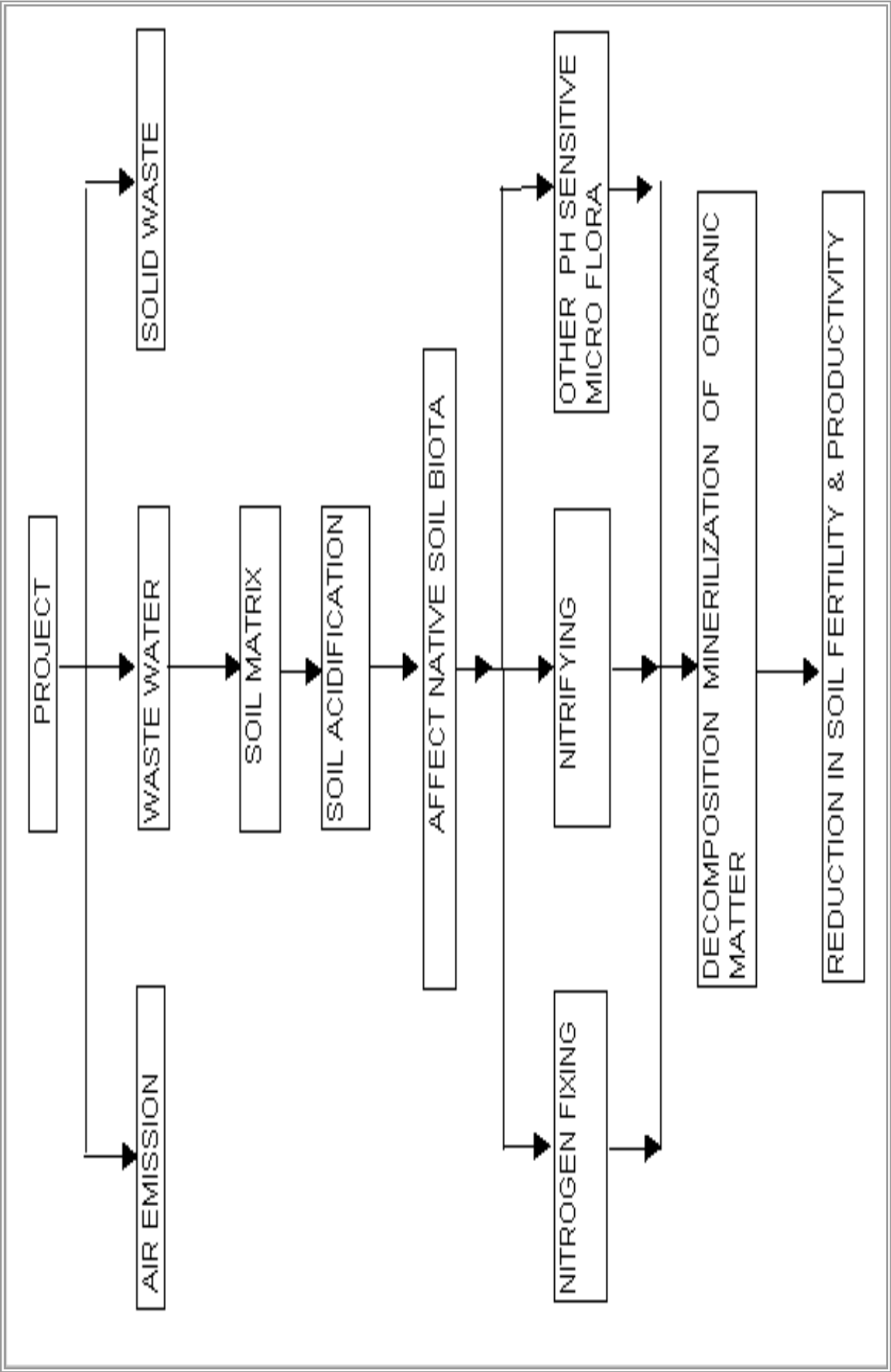


Figure 4.5 Impacts Network For Soil Micro Flora and Fauna

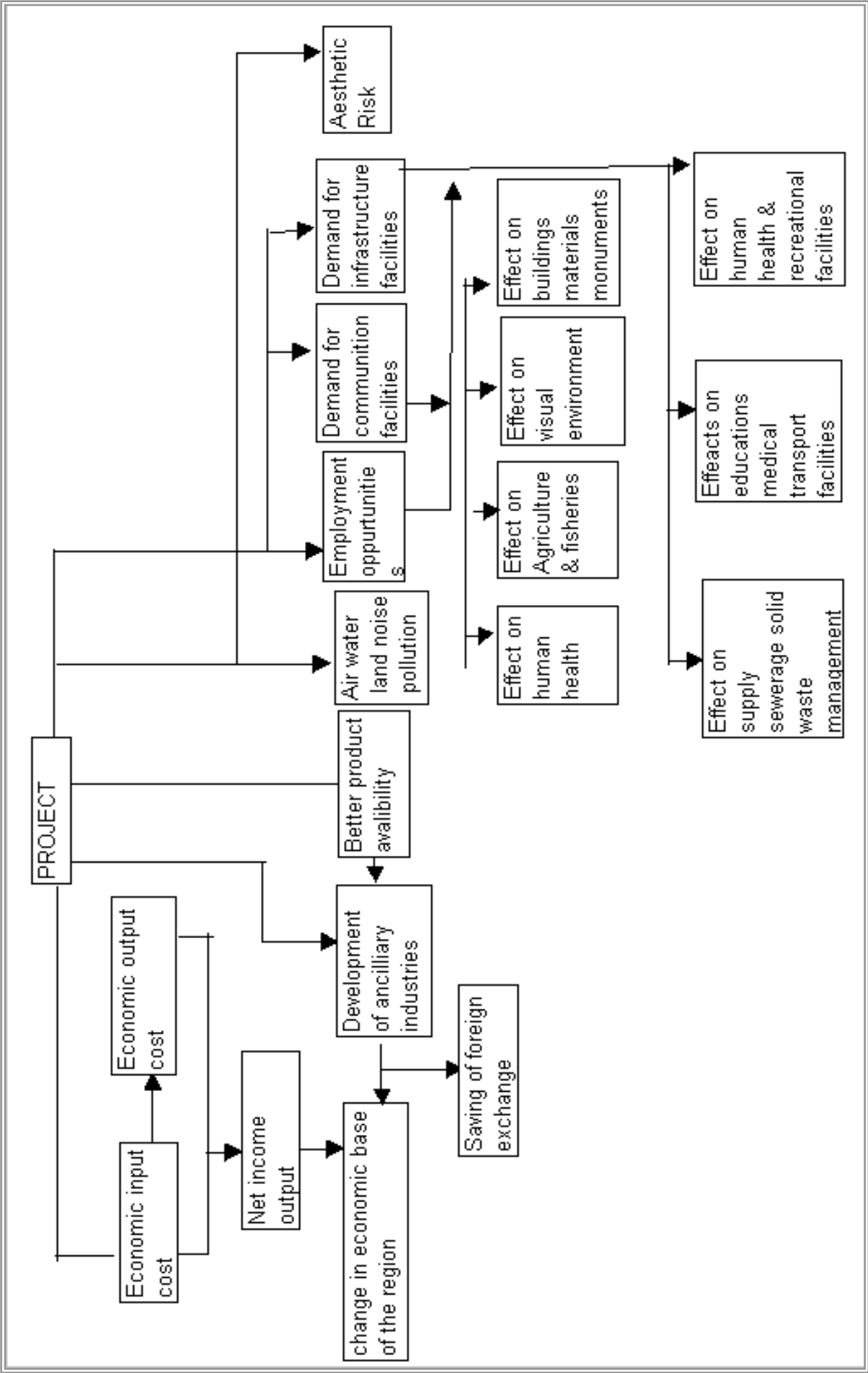


Figure 4.6 Impact Network For Socio-Economic And Cultural Environment

4.2 Prediction of Impacts

The identified impacts are assessed by posing questions related each activity of proposed expansion project and their interaction with environment. The statutory limits of ambient air quality, noise, emissions and discharges as mandated by the MoEF&CC was considered to classify the quantifiable impacts as acceptable or not acceptable. However there are few impacts that cannot be quantified, which need to be qualitatively assessed. There are a number of methods for qualitatively assessing the impacts to arrive at the significance of impact. The qualitative assessment of impacts require characterization with respect to its magnitude, geographic extent, duration, frequency, reversibility, probability of occurrence, confidence rating and impact rating. The manual published by MOEFCC prescribes the following process for determining the significance of impact; first, an impact is qualified as being either negative or positive. Second, the nature of impacts such as direct, indirect, or cumulative is determined using the impact network Third, a scale is used to determine the severity of the effect; for example, an impact is of low, medium, or high significance. Accordingly it was proposed to quantify the impacts which are a direct result of the activities contingent on availability of reliable prediction tools. In case the quantification is not feasible, a subjective assessment of the impact significance being low, medium or high was proposed.

4.2.1 Air Environment

The sources of air pollution in the proposed expansion activity are utility emissions, process emission, emissions from pollution control facilities, storages. The direct impact of utility emissions consisting of particulate matter, sulfur dioxide, and oxides of nitrogen results in change in criteria air contaminants in ambient air quality. The process emissions and other emissions, mainly contain Chlorine and Hydrogen Chloride are toxic and may result in change in health of the receptors both flora, and fauna including humans. The adoption of adequate mitigation measures shall reduce the impact to low levels. The storage of chlorinated solvents may also lead to diffuse emissions unless adequate mitigation measures like breather valves, double lined storage and condensers are adopted. All these emissions impact air quality negatively, resulting in health impacts indirectly. These impacts have medium

significance in case mitigation measures are in place, and shall have high significance in case of anthropogenic and natural emergencies as well as in case no mitigation measures are proposed. The change in ambient air quality due to the utility emissions of both the units that are proposing expansion, is predicted by using an air quality impact prediction model. The impacts due to the proposed expansion shall be felt mainly within the plant area and the immediate surroundings.

4.2.1.1 Details of Mathematical Modeling

A large number of different mathematical models for dispersion calculations are in practice in many parts of the world. Most of the models for prediction of downwind concentrations are based on Gaussian dispersion. The principle behind the Gaussian dispersion models is Gaussian probability distribution of concentration in both vertical and horizontal cross wind directions about the plume central line.

Predictions of ground level concentrations of the pollutants were carried out based on site meteorological data collected during the study period. For calculation of predicted ground level concentrations, ISCST3 model of Lakes Environmental based on USEPA, ISCST3 algorithms, was used; as it's based on more sophisticated algorithm incorporating deposition, better algorithm for area sources, etc.

Brief History of the ISC Models

The ISC3 models are based on revisions to the algorithms contained in the ISC2 models. The latter came about as a result of a major effort to restructure and reprogram the ISC models that began in April 1989, and was completed in March 1992. The reprogramming effort was largely motivated by the need to improve the quality, reliability, and maintainability of the code when numerous "bugs" were discovered after the implementation of the revised downwash algorithms for shorter stacks. However, the goals of the reprogramming effort also included improving the user interface by modifying the input file structure and the output products.

Overview of New Features in the ISC3 Models

The ISC3 models include several new features. A revised area source algorithm and revised dry deposition algorithm have been incorporated in the models. The ISC3 models also include an algorithm for modeling impacts of particulate emissions from

open pit sources, such as surface coal mines. The Short Term model includes a new wet deposition algorithm, and also incorporates the COMPLEX1 screening model algorithms for use with complex and intermediate terrain. When both simple and complex terrain algorithms are included in a Short Term model run, the model will select the higher impact from the two algorithms on an hour-by-hour, source-by-source, and receptor by- receptor basis for receptors located on intermediate terrain, i.e., terrain located between the release height and the plume height.

Some of the model input options have changed and newer input options have been added as a result of the new features contained in the ISC3 models. The source deposition parameters have changed somewhat with the new dry deposition algorithm, and there are new source parameters needed for the wet deposition algorithm in the Short Term model. There are also new meteorology input requirements for use of the new deposition algorithms. The option for specifying elevation units has been extended to source elevations and terrain grid elevations, in addition to receptor elevations.

The utility programs, STOLDNEW, BINTOASC, and METLIST have not been updated. While they may continue to be used as before, they are not applicable to the new deposition algorithms in the ISC3 models. The salient features of the ISCST3 model are presented below in [Table 4.1](#).

Table 4.1 Salient Features of the ISCST3 Model

S.No	Item	Details
1	Model name	ISCST3 (Based on USEPA algorithm)
2	Source Types	Point, Area, Volume, Open Pits
3	Dispersion Equation	Steady State Gaussian Plume Equation
4	Diffusion Parameters	Pasquill Gifford Co-efficient
5	Plume Rise	Briggs Equation
6	Time Average	1 hr to Annual/Period Has Short Term and Long Term modeling options
7	Deposition	Both Dry and Wet Deposition
8	Application Input Data:	
	(i) Source Data	Stack co-ordinates
	(ii) Receptor Data	Grid interval, number of receptors, receptor elevations
	(iii) Meteorological Data	Hourly meteorological data i.e. wind speed, direction, ambient temperature, stability and mixing heights

Model Formulation

The model uses the following steady state Gaussian plume equation. The basic equation for calculating the concentration of pollutants for any point in x, y, z co-ordinates is given below:

$$C(x,y,z,H) = \frac{Q}{2\pi \sigma_y \sigma_z U} \exp[-1/2(y/\sigma_y)^2] \times [\exp\{-1/2(z-h/\sigma_z)^2\} + \exp\{-1/2(z+H/\sigma_z)^2\}]$$

Where

C= Concentration of pollutants in mg/cu m

Q= Strength of emissions in g/sec.

H= Effective Height (m), i.e., physical height + plume raise

y, z= diffusion coefficients in y and z directions in m.

U= average wind velocity in m/sec.

The following assumptions are made in Gaussian dispersion model.

This model assumes no diffusion in the down wind direction and thus applicable to a plume and not a puff of pollutant. The dispersion parameter values used for horizontal dispersion coefficient and vertical dispersion coefficients are those given in the "Work book of atmospheric dispersion estimates". These dispersion coefficients assume a sampling time of about 10 min., the height values of interest to be in the lowest several hundred meters of the atmosphere, a surface corresponding to the open country. The stacks are tall enough to be free from building turbulence so that no aerodynamic down wash occurs. The given stability exists from ground level to well above the top of the plume.

The Gaussian dispersion model has been tested extensively for its validity and found to be reasonably applicable for different atmospheric conditions. BIS has also adopted this basic plume dispersion model. Hence the same model is adopted for predictions of downwind concentrations of pollutants in this report.

Meteorological Data

Data recorded by the weather monitoring station at site on wind speed, direction, solar insolation, temperature and cloud cover at one hourly interval for three months i.e. One full season has been used for computations.

Mixing Height

The mixing heights for ambient air quality predictions are adopted from Atlas of Hourly Mixing Height and Assimilative Capacity of Atmosphere in India by S.D Attri, Siddartha Singh, B. Mukhopadhyaya and A.K Bhatnagar, Published by Indian Metrological Department, New Delhi. 2008. The mixing heights range from 300 to 1450 m during summer season. There is no record of inversion for this area (Reference: Atlas of Hourly Mixing Height and Assimilative Capacity of Atmosphere in India by S.D Attri, Siddartha Singh, B. Mukhopadhyaya and A.K Bhatnagar, Published By Indian Metrological Department, New Delhi. 2008). There is no record of inversion in this area as observed from the IMD data.

4.2.1.2 Utility Emissions

The sources of air pollution from both the plants that are proposing expansion, are boilers and DG sets. The major pollutants generated from the fuel combustion are SO₂, NO_x and Particulate Matter. It may be noted that there is no major expansion in terms of utilities in SRAACL, while SRHHL proposes to install an additional coal fired boiler with 50 TPH capacity. Based on fuel analysis and combustion details the emission rates of above pollutants are calculated. The emission rates of SO₂, NO_x and Particulate Matter from each stack are presented in [Table 4.2](#).

Table 4.2 Emission Details of Pollutants from Stack

S.No	Stack Attached to	Stack Height m	Diameter of stack at top, m	Temp. of exhaust gases, °C	Exit Velocity, m/sec	Pollutant Emission Rate, g/sec			
						PM	SO ₂	NO _x	HCL
Sree Rayalaseema Alkalies And Allied Chemicals Limited									
Proposed									
1	1 x 500 KVA DG Set*	5	0.25	185	7.2	0.004	0.028	0.16	-
Existing									
1	1 x 45 TPH Coal fired Boiler	55	1.37	140	10	0.95	1.44	1.56	-
2	1 x 100TPH Coal fired Boiler	69	2.5	185	11.2	3.54	5.8	6.1	-
3	1 x 110 TPH Coal fired Boiler	80	2.9	185	16	5.39	9.14	11.78	-
4	1 x 160 KVA DG Set*	3	0.12	160	20	0.002	0.022	0.12	
5	1 x 285 KVA DG Set*	4	0.12	160	6.5	0.002	0.022	0.14	
6	1 x 400 KVA DG Set*	4	0.15	165	6.5	0.003	0.024	0.15	
7	1 x 500 KVA DG Set*	5	0.25	185	7.2	0.004	0.028	0.16	
8	1 x 383kg/hr Incinerator	12	0.6	45	7.0	-	-	2.43	0.1
Sree Rayalaseema Hi-Strength Hypo Limited									
Proposed									
1	1 x 50 TPH Coal fired boiler	55	2.6	165	15	3.95	2.99	3.6	

S.No	Stack Attached to	Stack Height m	Diameter of stack at top, m	Temp. of exhaust gases, °C	Exit Velocity, m/sec	Pollutant Emission Rate, g/sec			
						PM	SO ₂	NO _x	HCL
2	1 x 750 KVA DG Set*	6	0.3	165	7.5	0.005	0.03	0.11	
Existing									
1	1 x 3 TPH Husk Fired Boiler	20	0.5	160	6.5	0.8	0.2	0.25	
2	1 x 50 TPH Coal/Bio mass Fired Boiler	55	2.2	165	10.2	1.8	3.2	3.6	
3	1 x 725 KVA DG Set*	6	0.25	160	6.5	0.005	0.028	0.09	
4	1 x 750 KVA DG Set*	6	0.3	165	7.5	0.005	0.03	0.11	
5	6 x 1010 KVA DG set*	7	0.35	180	8.5	0.008	0.035	0.12	

4.2.1.3 Air Quality Predictions *(Terms of Reference No. 7(i))*

Predictions of ground level concentrations of the pollutants were carried out based on site meteorological data collected during the study period. For calculation of ground level concentrations a grid of 10 km X 10 km with a receptor interval of 400 meters is considered.

The composition of particulate matter was obtained from USEPA AIRCHIEF AP-42 and the same was considered in determining the source concentration of PM₁₀ and PM_{2.5} for prediction purpose. The predicted maximum 24 hourly ground level concentrations of Suspended Particulate Matter, PM₁₀, PM_{2.5}, SO₂ and NO_x and distance of occurrence during different seasons of study period are presented in **Table 4.3**.

It may be observed that the annual predicted maximum 24 hourly GLC's of PM, PM₁₀, PM_{2.5}, SO₂ and NO_x are 1.53, 0.61, 0.27, 5.79 and 5.89 µg/m³ respectively and the maximum values are observed at a distance of 1.9 km from the center of plant site in southwest direction. However it may be noted that the predicted values of the SO₂ and NO_x are based on the assumption that the DG sets are used constantly, where as the DG set usage is only during load shut down from APTRANSCO.

The GLC's are also predicted at air quality monitoring locations and the predicted GLC's are presented in **Tables 4.4** and the cumulative concentrations at various villages are tabulated in **Table 4.5**. It may be observed from the Table that the predicted results show that the incremental rise over existing base line status of ambient air quality is within the limits prescribed by National Ambient Air Quality

standards (NAAQ), and hence the impact due to the addition of utility for expansion is low on ambient air quality. Hence the control measures and height of stack is sufficient to disperse the pollutants into the atmosphere and keeping the baseline levels within the prescribed limits. The predicted ground level concentrations are graphically displayed for SPM, PM₁₀, PM_{2.5}, SO₂, and NO_x respectively in [Figure 4.7 - 4.11](#).

Table 4.3 Maximum Predicted 24 hourly GLC's

S.No	Parameter	Predicted GLC ($\mu\text{g}/\text{m}^3$)	Distance (km)	Direction
1	SPM	1.53	1.9	SW
2	PM ₁₀	0.61	1.9	SW
3	PM _{2.5}	0.27	1.9	SW
4	SO ₂	5.79	1.9	SW
5	NO _x	5.89	1.9	SW

Table 4.4 Predicted GLC's at Monitoring Locations

S.No	Monitoring Location	Direction	Distance (Km)	Predicted GLC ($\mu\text{g}/\text{m}^3$)				
				SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x
1	Etiavalatandrapadu	NW	0.6	0.088	0.035	0.016	0.334	0.340
2	Gondiparla	N	1.8	0.040	0.016	0.007	0.151	0.154
3	Basavapuram	SE	2.4	0.015	0.006	0.003	0.056	0.057
4	Kurnool	SW	1.4	0.086	0.035	0.016	0.327	0.333
5	Kasipur	NE	4.2	0.029	0.012	0.005	0.109	0.111
6	Devamada	SE	5.8	0.025	0.010	0.005	0.095	0.097
7	Munagalapadu	NW	6.4	0.061	0.025	0.011	0.232	0.236
Reserved Forests								
1	Gadidmadugu RF	E	5.5	0.026	0.01	0.00	0.10	0.10
2	Pullaiah RF	SW	9.3	0.057	0.02	0.01	0.22	0.22

Table 4.5 Cumulative Concentrations at Various Villages and Reserved Forests

Station	Distance (Km)	Baseline Concentration ($\mu\text{g}/\text{m}^3$)				Predicted GLC ($\mu\text{g}/\text{m}^3$)				Cumulative Concentration ($\mu\text{g}/\text{m}^3$)			
		PM ₁₀	PM _{2.5}	SO ₂	NO _x	PM ₁₀	PM _{2.5}	SO ₂	NO _x	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Etiavalatandrapadu	0.6	54	24	14	14	0.04	0.02	0.33	0.34	54.04	24.02	14.33	14.34
Gondiparla	1.8	48	22	12	12	0.02	0.01	0.15	0.15	48.02	22.01	12.15	12.15
Basavapuram	2.4	48	19	12	12	0.01	0.00	0.06	0.06	48.01	19.00	12.06	12.06
Kurnool	1.4	56	26	16	16	0.03	0.02	0.33	0.33	56.03	26.02	16.33	16.33
Kasipur	4.2	46	19	12	11	0.01	0.01	0.11	0.11	46.01	19.01	12.11	11.11
Devamada	5.8	46	19	12	13	0.01	0.00	0.09	0.10	46.01	19.00	12.09	13.10
Munagalapadu	6.4	39	22	12	13	0.02	0.01	0.23	0.24	39.02	22.01	12.23	13.24
Reserved Forests													
Gadidmadugu RF	5.5					0.01	0.00	0.10	0.10	0.01	0.00	0.10	0.10
Pullaiah RF	9.3					0.02	0.01	0.22	0.22	0.02	0.01	0.22	0.22

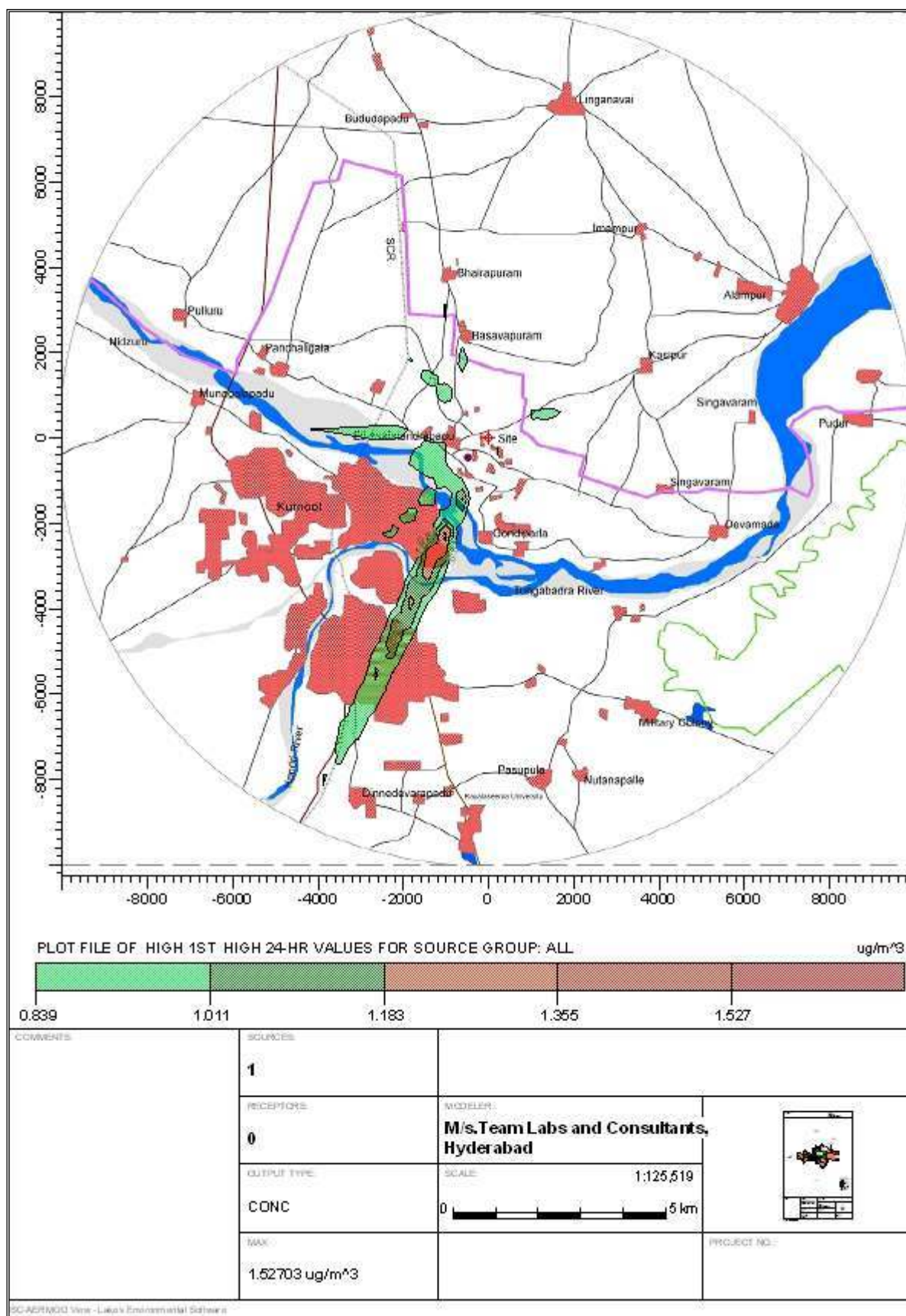
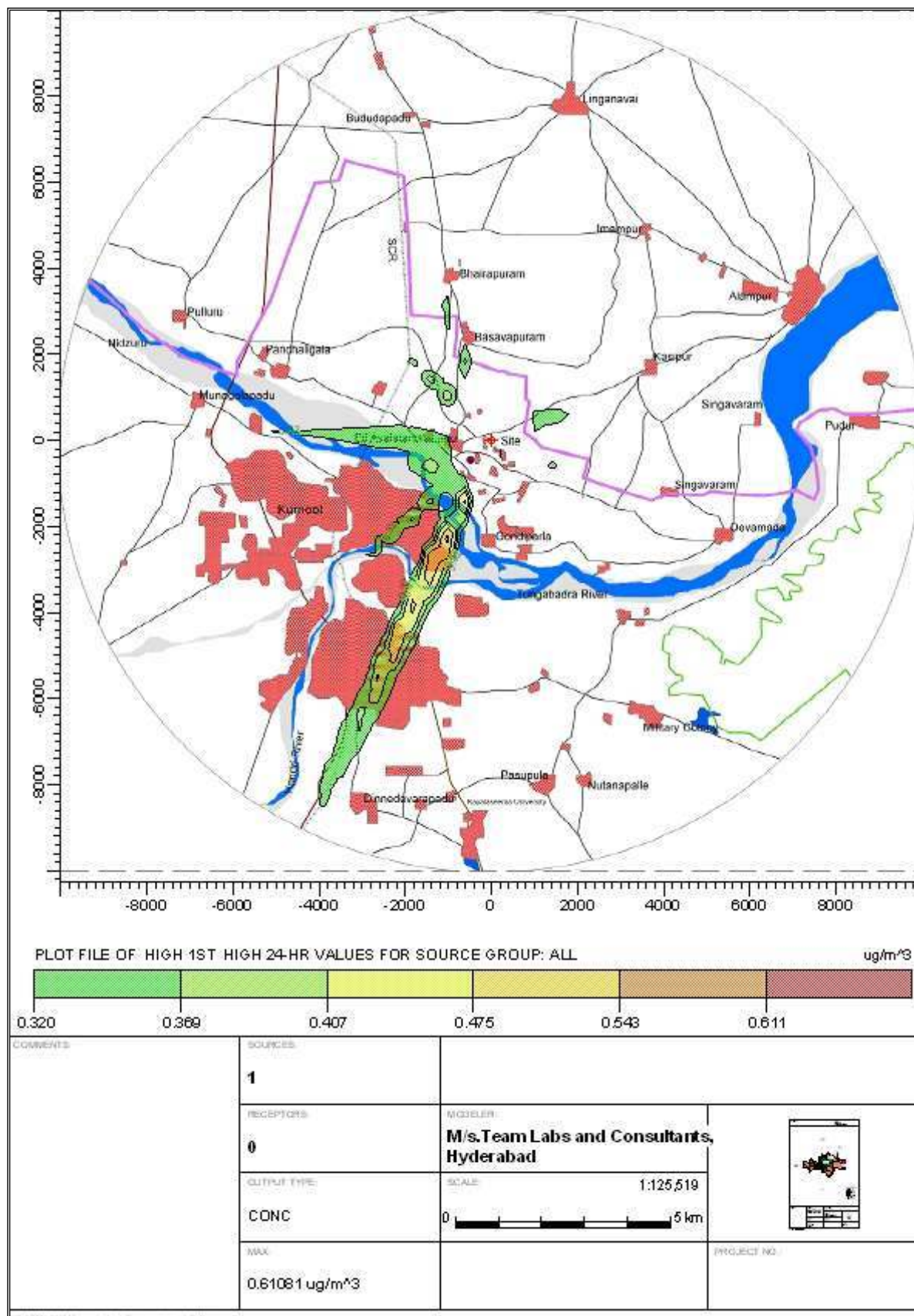
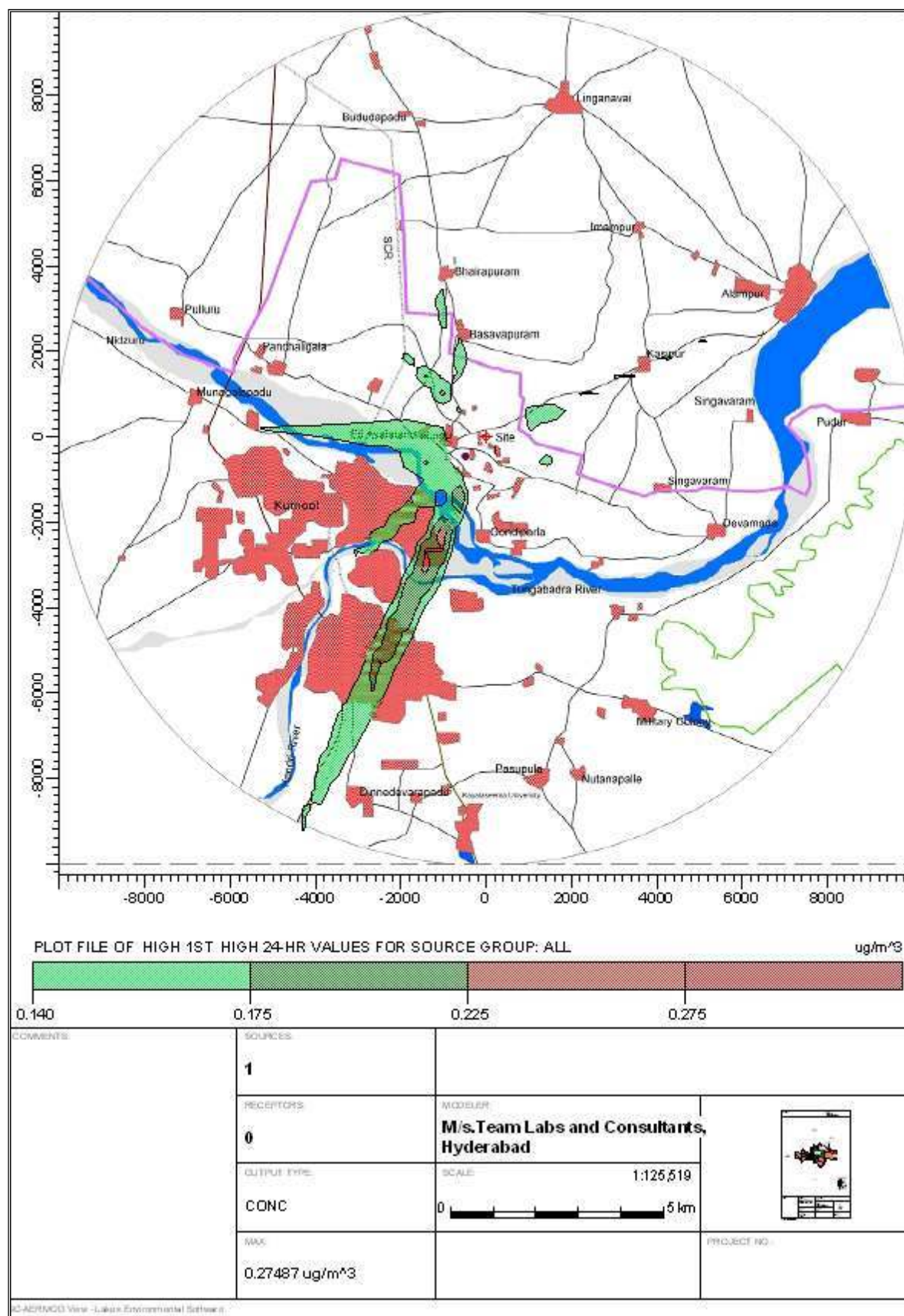
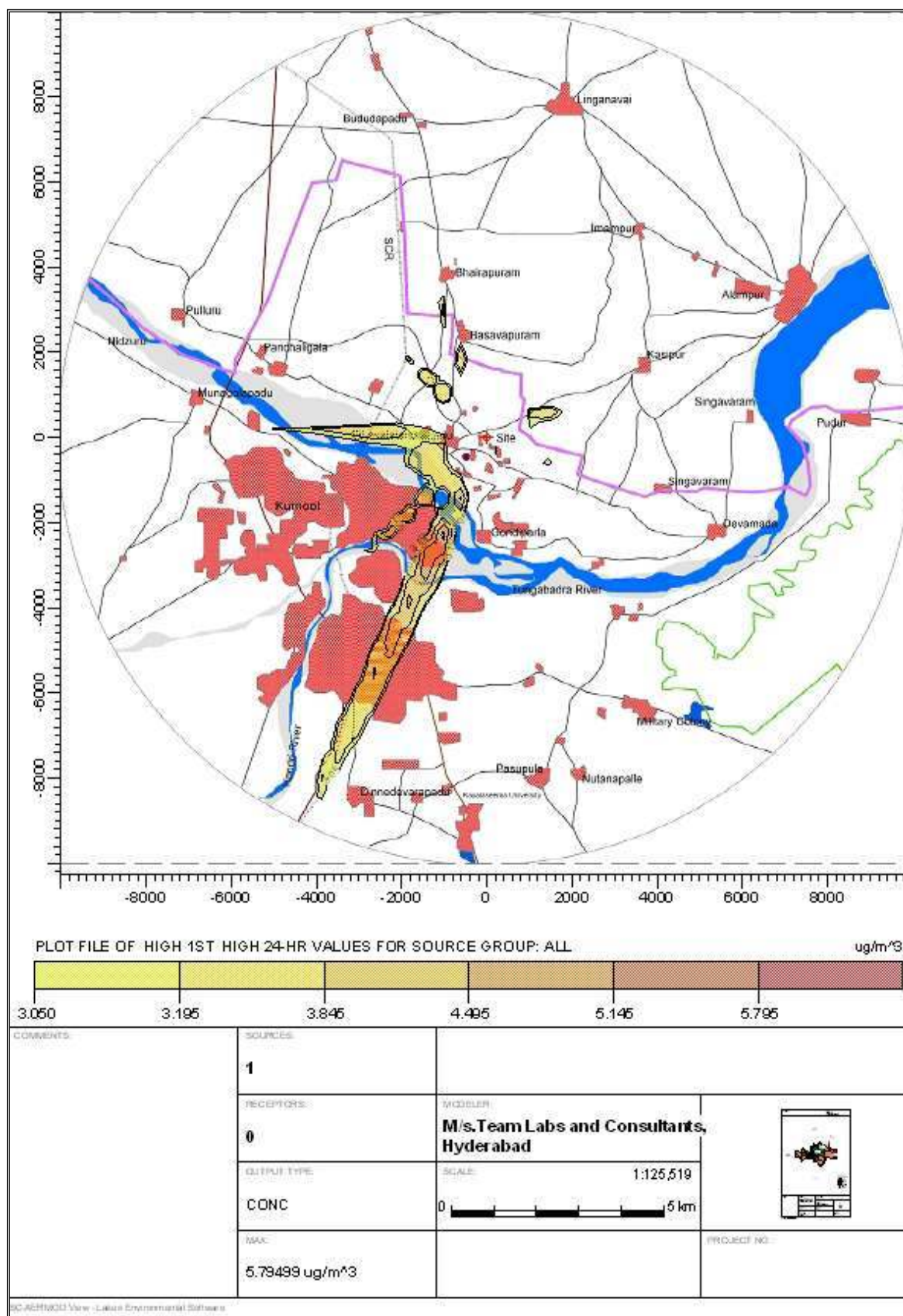
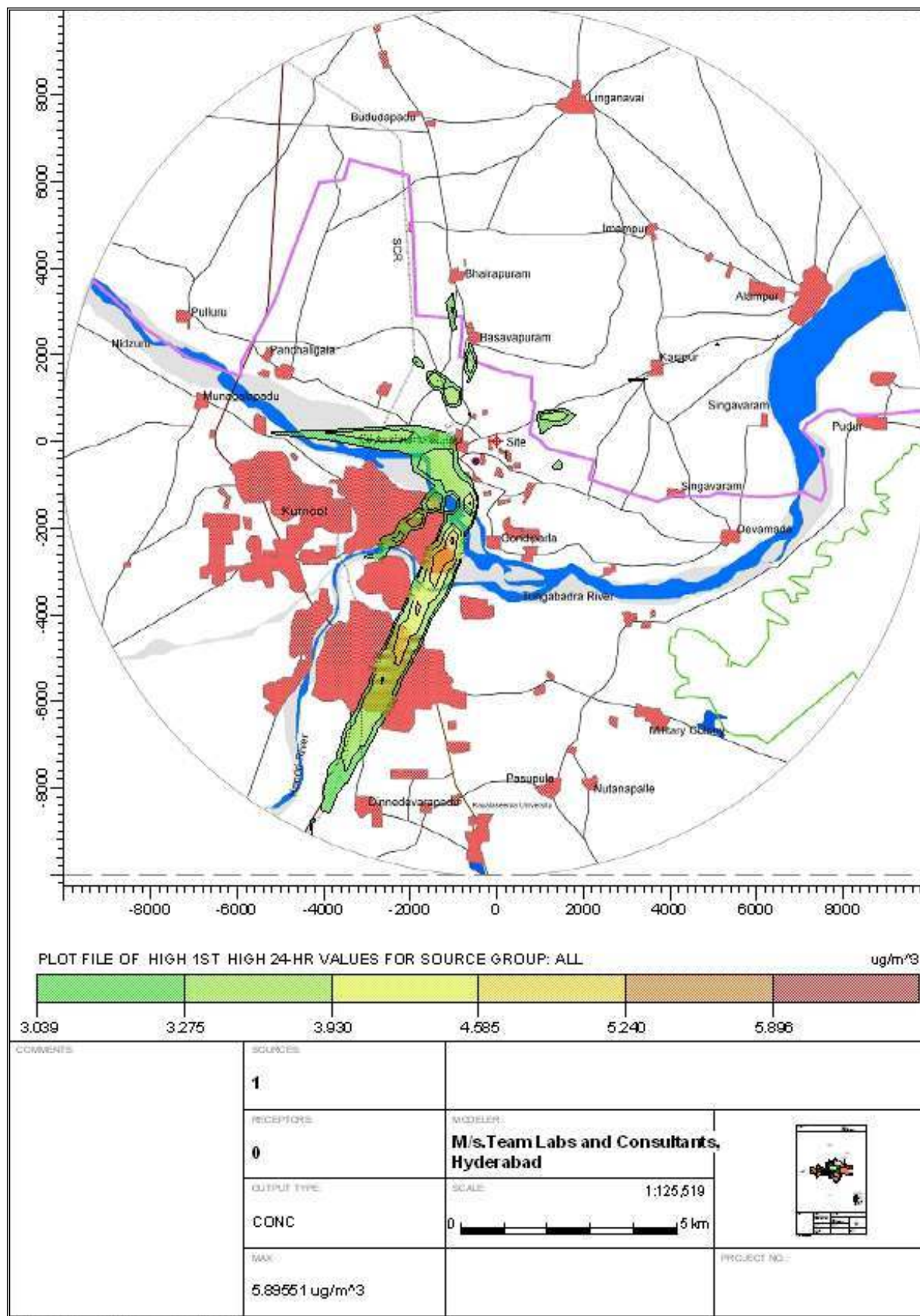


Figure 4.7 Isopleths Showing 24 Hourly GLC's of SPM

Figure 4.8 Isopleths Showing 24 Hourly GLC's of PM₁₀

Figure 4.9 Isopleths Showing 24 Hourly GLC's of PM_{2.5}

Figure 4.10 Isopleths Showing 24 Hourly GLC's of SO₂

Figure 4.11 Isopleths Showing 24 Hourly GLC's of NO_x

4.2.2 Water Environment

The water environment of the proposed expansion consists of water abstraction of intake wells in Tungabhadra river, and effluents from process, utilities and domestic usage. The total fresh water required of quantity 17.779 MLD out of which 14.484 MLD fresh water and 2.295 MLD of recycled water. The impact on the river regime was studied by the irrigation department of Government of Andhra Pradesh, which issued a clearance allowing 20 MLD abstraction of surface water from Tungabhadra river. The impact on the river flow is low, as the clearance was issued after considering all the users of surface water with respect to change in surface water quality due to draw down, due to flow dynamics and drainage pattern changes. The effluent generation in the plant may have a direct negative impact with high significance, on both ground and surface water regimes, if mitigation measures are not adopted and the effluents are disposed without treatment. The release of effluents may change ground water quality, change in run off quality, change in ground water and surface water interaction, change in channel morphology leading to deterioration of production levels of both terrestrial and aquatic flora and fauna, resulting in higher concentrations of chemicals in food chain. The expansion proposes treatment of wastewater and reusing it in process and for on land irrigation. The mitigation measure shall hence ensure that the impact is of low significance, and ensure sustainability of water resource. The impact of these activities are both direct and indirect effecting both soil

4.2.3 Noise Environment

The project activities that have an impact on noise environment are operation of motors, pumps, compressors, turbines, DG sets resulting in direct impact of increasing ambient noise levels both within the work room area and out side. Excessive noise will trigger health risks such as headaches, depression, deafness and retardation of sensory mechanisms in the impact area population. The incremental noise levels due to these activities were predicted and the values reflect low impact out side the premises. The increase in noise levels shall have low impact, restricted to within site area due to its low magnitude and occasional frequency. The incremental noise levels however shall have direct negative impact on the noise

levels, with low significance due to mitigation measures and also due to absence of sensitive receptors within 200 m of the sources.

4.2.3.1 Prediction of Impact on Noise Quality

The sound pressure level generated by noise source decreases with increasing distance from the source due to wave divergence. An additional decrease in sound pressure levels also occurs with increasing distance from the source due to atmospheric effect or interaction with the objects in the transmission path. This is due to excess attenuation. The sound pressure level is also affected by medium of travel and environmental conditions. The propagation model has been devised to take into account these factors and predict the noise levels at various distances round a single or a multiple source. The model uses the following formula as a basis for such predictions.

$$(L_{ob}) = (L_r) - (L_{div}) - (L_{atm})$$

Where (L_{ob}) = Observed noise level at a distance R from source
 (L_r) = Noise level of source measured at reference distance r
 (L_{div}) = Loss due to divergence at distance R from source
 $= 20 \log (R/r)$
 (L_{atm}) = Attenuation due to atmosphere at distance R from the source.
 $= a \times R/100$, where a is atmospheric attenuation coefficient in dB (A)/100m.

For hemispherical wave divergence in a homogenous loss free atmosphere $(L_{atm}) = 0$.

The total impact of all sources at particular place is then estimated by adding as the contribution of noise from each of the following sources as follows;

$$(L_{eq}) = 10 \log \sum_{i=1}^n \{10^{(L_{ob})^i/10}\}$$

Where n = total number of sources

The calculated noise levels are further super imposed (logarithmically) on the background noise levels. The model assumes that the noise spectrum is mainly centered on a spectrum of 1000 Hz and attenuation due to building materials is also at the same frequency.

The major sources of noise generation are DG sets, soot blowing of boiler, compressors and motors, which emit noise level of maximum 90 dB (A) - 110 dB (A) at a reference distance of 1m from the source. The predicted cumulative noise levels

due to the source and the existing level as calculated from the logarithmic model without noise attenuation ranged between 55 and 75 Db (A) at distances ranging between 87 to 165 m which falls within the plant boundary. The impact of noise on the population in the surrounding area will be negligible, as the nearest habitation is atleast 500 m away from the site.

4.2.4 Land Environment

The proposed expansion plan does not involve any major civil construction or additional land acquisition, and hence disturbance to soil environment with respect to soil profile disturbance and erosion. However accidental discharge of chlorine and other gases, as well as effluents may lead to contamination of soil. There is no alteration of terrain, and may lead to additional sealing of land due to increased foot print. The proposed expansion shall also result in increased generation of solid waste, mainly brine sludge which is considered as low concentration, high volume waste. Handling of brine sludge has a potential to contaminate soil, ground water, land capability and permeability of soil. change in the land use during and after construction phase is unavoidable. However as long as it is not affecting the soil quality chemistry and sedimentation, the impact is not an undesirable one. The impact on land environment is mainly due to accidental spillages of chemicals, effluents and wastes. The expansion project has neutral impact on land environment, terrain and soils as there is no additional land requirement, and the impacts if any are restricted to within the site with negligible magnitude and is felt mainly during expansion work only. The operational phase impacts shall be low due to effective implementation of mitigative measures in handling, storing and transferring wastes, effluents and chemicals.

4.2.5 Biological Environment

The ecological factors that are considered most significant as far as the impact on flora and fauna concerned are:

1. Whether there shall be any reduction in species diversity?
2. Whether there shall be any habitat loss or fragmentation?
3. Whether there shall be any additional risk or threat to the rare or endangered or endemic or threatened (REET) species?

4. Whether there shall be any impairment of ecological functions such as
 - (i) disruption of food chains,
 - (ii) decline in species population and or
 - (iii) Alterations in predator-prey relationships?
5. Whether it is possible to attain the global objectives of 'no net loss' of biodiversity?
6. Whether it is possible to improve the biological diversity through the proposed activity?

There is no direct threat to any rare or endangered or threatened biological species as indicated by the baseline data, due to the proposed expansion project, as it entails no additional land acquisition, and the proposed construction area has sparse vegetation. There are two reserve forests in the study area. Gadidmadugu RF at a distance of 5.5 Km in east direction. Pullaiah RF at a distance of 8.7 Km in southwest direction. The project is not going to cause any fragmentation of habitat or disruption of food cycles or destruction of breeding grounds or blockade of migratory routes. The major impacts of the project are mainly during construction and subsequently on account of atmospheric pollution. The industry is required to limit its emissions as per the NAAQ of 2009. It has to strictly adhere to the conditions stipulated by the regulatory bodies. The project authorities are going to take all steps and measures in order to strictly comply with National Ambient Air Quality Standards of 2009. The project may not have impacts on terrestrial flora and fauna. Further, as there are no rare or endangered or threatened (RET) species within the impact area, the project does not pose any direct threat to the survival of any rare species. Hence, the proposed project activity is unlikely to pose any additional threat to REET species in the impact area. It may be concluded that the impacts are indirect, and positive due to increasing the density of green belt, and of low significance. The impacts can be however be direct and negative with high significance in case of any accident as Chlorine and Hydrogen Chloride may lead to distress and mortality of flora and fauna.

4.2.6 Socio-economic Environment

The expansion project envisages additional employment to 350 people, with an annual salary outlay of Rs. 10 Crores which will have a direct positive impact with medium significance, as the local area has numerous educational institutions providing graduates and post graduates in chemical, civil, electrical, mechanical

engineering and chemistry. The expansion does not require any additional connectivity as the existing infrastructure is adequate reflecting in low impact. The site is near Kurnool town, which has excellent infrastructure with respect to housing, education, health and civic amenities, and hence the additional influx of 350 people may have low impact on infrastructure availability. The impact on health was assessed by air quality impact predictions and was observed to be within prescribed NAAQ standards. There will be medium significant, direct negative impact due to community expectations and public safety concern as the unit handles, and produces hazardous chemicals. The proposed CSR activities from the company shall also enhance the public approval for the project and ensure improvement in infrastructure in the surrounding villages. The overall impact due to this expansion shall be positive, both direct and indirect with high significance.

4.2.7 Prediction of Impact on Vehicular Traffic

As the plant is located 5 km from the national highway there will not be any unauthorized shop or settlements along the road connecting the plant site. The traffic density of the connecting road is low mainly consisting of local transport, commercial and passenger vehicle traffic. Raw materials and finished products are transported by road using road trucks. The additional traffic generated due to the proposed expansion of both the units (SRAACL and SRHHL) plants shall be 250-270 truck trips per day. There will be marginal increase in the traffic density.

The traffic study for the both the units of the connecting road revealed that the peak traffic volume in PCU is 0.27 during 8 to 9 am , and the level of service of the connecting road remains B, after expansion also. Modified level of service for connecting roads considering the additional truck trips for both the unit for proposed expansion is presented in [Table 4.6](#)

Table 4.6 Modified level of services for connecting roads

Road	Existing volume, PCU/hr	Existing volume/ Capacity	Additional volume	Modified Volume	Modified volume/ Capacity	Modified Los & performance
NH-7 to Gondiparla Village	434	0.24	60	494	0.27	"B" Very Good

5.0 ANALYSIS OF ALTERNATIVES

The chloro-alkali industry is a major branch of the chemical industry. Its primary products are chlorine, sodium hydroxide and hydrogen which are produced from rock salt, a readily accessible raw material.

Analysis of alternatives was undertaken to assess sites, process, technology and treatment options. The site is not assessed in this case as it is an expansion project. The objective of this assessment is to identify best available technology not entailing excessive costs, and to reduce pollution loads by optimizing both raw material and resource consumption.

5.1 Alternative Sites

The proposal is for expanding the existing unit, and the land area available for expansion is sufficient and hence there is no requirement of alternative site or additional site area.

5.2 Alternatives in Process

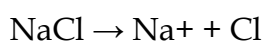
a. Chloralkali Process

In 1800, Cruickshank was the first to prepare chlorine electrochemically. The process was, however, of little significance until the development of a suitable generator and of synthetic graphite for anodes in 1892. These two developments made possible the electrolytic production of chlorine, the Chlor-alkali process, on an industrial scale. About the same time, both the diaphragm cell process (Griesheim cell, 1885) and the mercury cell process (Castner-Kellner cell, 1892) were introduced. The membrane cell process was developed much more recently in 1970. The main three technologies applied for chlor-alkali production are the diaphragm cell process (Griesheim cell, 1885), the mercury cell process (Castner-Kellner cell, 1892), and the membrane cell process (1970)., mainly using sodium chloride as feed or to a lesser extent using potassium chloride for the production of potassium hydroxide.

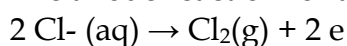
Each process represents a different method of keeping the chlorine produced at the anode separate from the caustic soda and hydrogen produced, directly or indirectly, at

the cathode. The basic principle in the electrolysis of a sodium chloride solution is the following: - At the anode, chloride ions are oxidised and chlorine (Cl₂) is formed. - At the cathode: In the mercury process a sodium/mercury amalgam is formed and hydrogen (H₂) and hydroxide ions (OH⁻) are formed by the reaction of the sodium in the amalgam with water in the denuder. In membrane and diaphragm cells, water decomposes to form hydrogen (H₂) and hydroxide ions (OH⁻) at the cathode. There are three basic processes for the electrolytic production of chlorine, the nature of the cathode reaction depending on the specific process.

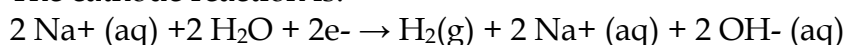
For all processes the dissolving of salt, sodium chloride, is:



The anode reaction for all processes is:



The cathode reaction is:



The overall reaction is:



Inputs and pollutant outputs from the Chlor-alkali industry are quite specific to the cell technology used, the purity of the incoming salt and the specifications of the products. The chlor-alkali process is one of the largest consumers of electrical energy. A simplified process diagram of the three cell technology processes is presented in **Fig 5.1**. A comparative statement presenting the main characteristics of each process is presented in **Table 5.1**. The advantages and disadvantages of these three processes are presented in **Table 5.2**.

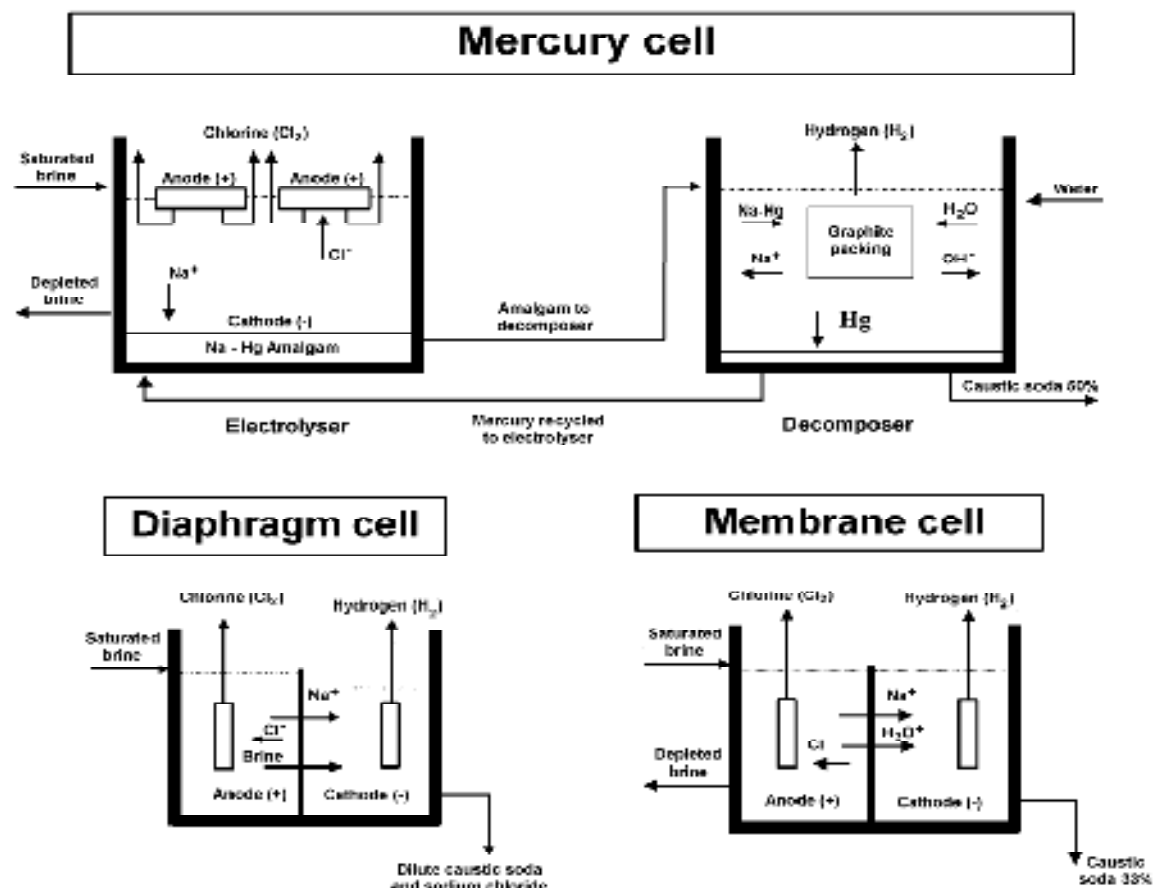


Fig 5.1. Simplified scheme of Electrolysis Cells

Table 5.1 Main Characteristics of Electrolysis Process

	Mercury	Diaphragm	Membrane
Caustic Quality	High, <30 PPM NaCl 5- 150 μg Hg/ l (Before treatment the Hg level is between 2.5 - 25 mg Hg/l)	1.0 - 1.5% by weight NaCl (Before treatment the NaCl content is about 18%) 0.1 % NaClO_3 Not suitable for some applications	High <50 PPM NaCl
Caustic concentration	50 %	12 % requires concentrations to 50% for some applications	33% requires concentration to 50 % for some applications
Chlorine Quality	Contains low levels of oxygen (<0.1%) and hydrogen	Oxygen content between 1.5 - 2.5 %	Oxygen content between 0.5% and 2 % depending on whether an acidified electrolyte is used.
Brine feedback	Some purification required but depends on purity of salt or brine used	Some purification required but depends on purity of salt or brine used	Very high purity brine is required as impurities affect membrane

			performance
Variable electric load performance	Good variable electricity load performance, down to 30 % of full load possible for some cell rooms, which is very important in some European countries	Tolerates only slight variation in electricity load and brine flows in order to maintain diaphragm performance	Variable electricity load performance less than for mercury (40 - 60%) depending on design load), affects product quality, and efficiency at lower loads

Historical mercury and PCDD/Fs contamination of land and waterways from mercury and diaphragm chlor-alkali plants is a big environmental problem at some sites. For many years, the mercury cell has been a significant source of environmental pollution, because some mercury is lost from the process to air, water, products and wastes. Inorganic mercury can be metabolised to form highly toxic methyl mercury by anaerobic bacteria, and this organic mercury is bio-accumulated¹ in the food chain. The diaphragm cell process has a potential to release asbestos emissions into work room atmosphere.

Table 5.2 Advantages and Disadvantages of the Three Chlor-Alkali Process

Process	Advantages	Disadvantages
Diaphragm Process	Use of well brine, low electrical energy consumption	Use of asbestos, high steam consumption for caustic concentration in expensive multistage evaporators, low purity caustic, low chlorine quality, cell sensitivity to pressure variations
Mercury Process	50 % caustic direct from cell, high purity chlorine and hydrogen, simple brine purification	Use of mercury, use of solid salt, expensive cell operation, costly environmental protection, large floor space
Membrane Process	Low total energy consumption, low capital investment , inexpensive cell operation, high-purity caustic, insensitivity to cell load variations and shutdowns, further improvements expected	Use of solid salt, high purity brine, high oxygen content in chlorine, high cost of membranes

The manufacturing technology chosen for chlor-alkali plant is membrane technology which is environment friendly, compared to the other two technologies. Accordingly SRAACL was the first in the country to adopt membrane technology based chlor alkali manufacturing.

b. Chloromethane Process

The manufacturing of chloromethane is initiated by Methyl chloride manufacturing either by hydro chlorination of methanol or chlorination of methane (Hoechst process), followed chlorination of methyl chloride (Shauffer process). Both the processes of methyl chloride were evaluated with respect to safety and environmental aspects, and hydrochlorination of methanol was adopted as the reaction is in liquid phase, and less hazard of handling hydro chloric acid compared to chlorine and methane. Accordingly HUALU process was adopted which involves 3 steps;

Hydro chlorination of methanol in vapour phase in presence of catalyst, thermal chlorination of methyl chloride in vapour phase with chlorine and rectification, azeotrope separation and dehydration of the mixed products.

Resource consumption

The electrolysis process is energy intensive. The selection of membranes is contingent on the energy consumption, and efficiency. The usage of water is mainly for brine preparation, scrubbers, washings and cooling towers. The alternatives assessed are usage of high pressure water jet in place of fill and vacate method of washing is chosen as the best alternative of equipment washing. Rejects from RO of pre-treatment of water, treatment of utility wastewater will be used for brine make-up as an alternative instead of fresh brine for process. The water requirement is reduced by adopting reuse of treated wastewater.

5.3 Alternatives in Technology

The manufacturing process results in gaseous products of chlorine and hydrogen which require specific containment and handling practices. The entire electrolysis process, storage areas are provided with DCS system, with adequate scrubber systems provided for both emergency and regular operations. There is no additional storage of

chlorine proposed as part of the expansion. The existing storage facility is in an enclosed area as a secondary mitigation measure followed by emergency scrubber system, which is adopted for the first time in the country by SRAACL. SRAACL proposes to adopt DCS system for complete operation of chloromethanes and chlorodifluoromethanes to minimise the diffuse and fugitive emissions.

5.4 Alternatives in treatment/mitigation options

The emission sources in the proposed expansion project are utilities, storages, process and effluent treatment system. The alternatives assessed for mitigating emissions process is double stage scrubbing system, emergency scrubbing system, enclosed storage facility, closed transfer systems. Emergency scrubbers are provided to mitigate both diffuse and process emissions of chlorine and Hydrogen Chloride, and the resultant product is sold as by product.

6.0 ENVIRONMENTAL MONITORING

6.1.1 Introduction

The environmental monitoring programme provides such information on which management decision may be taken during construction and operation phases. It provides basis for evaluating the efficiency of mitigation and pollution control measures and suggest further actions that need to be taken to achieve the desired effect.

The monitoring includes:

- (i) Visual observations;
- (ii) Monitoring of environmental parameters at specific locations;
- (iii) Sampling and regular testing of these parameters.

6.1.2 Objectives

The objectives of the environmental monitoring programme are:

- Evaluation of the efficiency of mitigation and pollution control measures;
- Updating of the actions and impacts on baseline data;
- Adoption of additional mitigation measures if the present measures are insufficient;
- Generating the data, which may be incorporated in environmental management plan in future projects.

6.1.3 Methodology

Monitoring methodology covers the following key aspects:

- Components to be monitored;
- Parameters for monitoring of the above components;
- Monitoring frequency;
- Monitoring standards;
- Responsibilities for monitoring;
- Direct responsibility,
- Overall responsibility;
- Monitoring costs.

Environmental monitoring of the parameters involved and the threshold limits specified are discussed below for the proposed expansion of synthetic organic chemicals (Bulk drug manufacturing) unit of M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL).

6.1.4 Ambient Air Quality (AAQ) Monitoring

Ambient air quality parameters recommended are PM₁₀, PM_{2.5}, Oxides of Nitrogen (NO_x) and Sulphur Dioxide (SO₂). These are to be monitored at designated locations starting from the commencement of construction activity. Data should be generated at all identified locations in accordance to the National Ambient Air Quality Standards (Table 6.1) location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan.

Table 6.1 National Ambient Air Quality Standards

S.No	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecological Sensitive Area (Notified by Central Government)	Methods of Measurement
1	Sulphur Dioxide (SO ₂)	Annual*	50	20	Improved west and Gaeke Ultraviolet fluorescence
		24 Hours**	80	80	
2	Nitrogen Dioxide (NO ₂)	Annual*	40	30	Modified Jacob & Hochheiser (Nn-Arsenite) Chemiluminescence
		24 Hours**	80	80	
3	Particulate Matter (Size Less than 10 µm) or PM ₁₀	Annual*	60	60	Gravimetric TOEM Beta Attenuation
		24 Hours**	100	100	
4	Particulate Matter (Size Less than 2.5µm) or PM _{2.5}	Annual*	40	40	Gravimetric TOEM Beta Attenuation
		24 Hours**	60	60	
5	Ozone (O ₃)	8 hours**	100	100	UV Photometric Chemiluminescence Chemical Method
		1 hour**	180	180	
6	Lead (Pb)	Annual*	0.50	0.50	AAS /ICP method after sampling on EPM 2000 or equivalent filter paper ED-XRF using Teflon filter.
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO)	8 hours**	02	02	Non Dispersive Infra Red (NDIR)

		1 hour**	04	04	Spectroscopy
8	Ammonia (NH ₃)	Annual* 24 hours**	100 400	100 400	Chemiluminescence Indophenol blue method
9	Benzene (C ₆ H ₆)	Annual*	05	05	Gas Chromatography based continuous analyzer Absorption and Desorption followed by GC analysis
10	Benzo (o) Pyrene(BaP) - Particulate Phase only,	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As),	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni),	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

*Average Arithmetic mean of minimum 104 measurement in a year taken for a week 24 hourly at uniform interval.

**24 hourly/8 hourly values should meet 98 percent of the time in a year

6.1.5 Water Quality Monitoring

The physical and chemical parameters recommended for analysis of water quality relevant are pH, total solids, total dissolved solids, total suspended solids, oil and grease, COD, chloride, lead, zinc and cadmium. The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan. The monitoring of the water quality is to be carried out at all identified locations in accordance to the Indian Standard Drinking Water Specification – IS 10500: 1991 (stated in [Table 6.2](#))

Table 6.2 Indian Standard Drinking Water Specifications - IS: 10500:1991

S. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternates	Methods of Test (Ref. To IS)	Remarks
ESSENTIAL CHARACTERISTICS						
1	Colour, Hazen units, Max.	5	Above 5, consumer acceptance decreases	25	3025 (Part 4)1983	Extended to 25 only if toxic substances are not suspected, in absence of alternate sources
2	Odour	Unobjectionable	-	-	3025 (Part 5):1984	a) Test cold and when heated b) Test at several dilutions
3	Taste	Agreeable	-	-	3025 (Part 7 & 8)1984	Test to be conducted only after safety has been established
4	Turbidity NTU, Max.	5	Above 5, consumer acceptance decreases	10	3025 (Part 10)1984	-
5	pH Value	6.5 to 8.5	Beyond this range, the water will affect the mucous membrane and/or water supply system	No relaxation	3025 (Part 11)1984	-
6	Total hardness (as CaCO ₃) mg/l, Max	300	Encrustation in water supply structure and adverse effects on domestic use	600	3025 (Part 21)1983	-
7	Iron (as Fe) mg/l, Max	0.3	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures, and promotes iron bacteria	1	32 of 3025 : 1964	-
8	Chlorides (as Cl) mg/l, Max	250	Beyond this limit, taste, corrosion and palatability are affected	1000	3025 (Part 32)1988	-

S. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Altern	Methods of Test (Ref. To IS)	Remarks
9	Residual, free chlorine, mg/l, <i>Min</i>	0.2	-	-	3025 (Part 26)1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be <i>Min</i> 0.5 mg/l
DESIRABLE CHARACTERISTICS						
1	Dissolved solids mg/l, <i>Max</i>	500	Beyond this palatability decreases and may cause gastro intestinal irritation	2000	3025 (Part 16)1984	-
2	Calcium (as Ca) mg/l, <i>Max</i>	75	Encrustation in water supply structure and adverse effects on domestic use	200	3025 (Part 40)1991	-
3	Magnesium (as Mg), mg/l, <i>Max</i>	30	Encrustation to water supply structure and adverse effects on domestic use	100	16, 33, 34 of IS 3025: 1964	-
4	Copper (as Cu) mg/l, <i>Max</i>	0.05	Astringent taste, discoloration and corrosion of pipes, fitting and utensils will be caused beyond this	1.5	36 of 3025: 1964	-
5	Manganese (as Mn) mg/l, <i>Max</i>	0.1	Beyond this limit taste/appearance are affected, has adverse effects on domestic uses and water supply structures	0.3	35 of 3025: 1964	-
6	Sulphate (as 200 SO ₄) mg/l, <i>Max</i>	200	Beyond this causes gastro intestinal irritation when	400	3025 (Part 24) 1986	May be extended up to 400 provided (as Mg) does not

S. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Altern	Methods of Test (Ref. To IS)	Remarks
			magnesium or sodium are present			exceed 30
7	Nitrate (as NO ₂) mg/l, <i>Max</i>	45	Beyond this, may cause methaemoglobinemia	100	3025 (Part 34) 1988	-
8	Fluoride (as F) mg/l, <i>Max</i>	1	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	23 of 3025: 1964	-
9	Phenolic compounds (As C ₆ H ₅ OH) mg/l, <i>Max</i>	0.001	Beyond this, it may cause objectionable taste and odour	0.002	54 of 3025: 1964	-
10	Mercury (as Hg) mg/l, <i>Max</i>	0.001	Beyond this, the water becomes toxic	No relaxation	(see Note) Mercury ion analyzer	To be tested when pollution is suspected
11	Cadmium (as Cd), mg/l, <i>Max</i>	0.01	Beyond this, the water becomes toxic	No relaxation	(See note)	To be tested when pollution is suspected
12	Selenium (as Se), mg/l, <i>Max</i>	0.01	Beyond this, the water becomes toxic	No relaxation	28 of 3025: 1964	To be tested when pollution is suspected
13	Arsenic (As As) mg/l, <i>max</i>	0.05	Beyond this, the water becomes toxic	No relaxation	3025 (Part 37) 1988	To be tested when pollution is suspected
14	Cyanide (As CN), mg/l, <i>Max</i>	0.05	Beyond this limit, the water becomes toxic	No relaxation	3025 (Part 27) 1986	To be tested when pollution is suspected
15	Lead (as Pb), mg/l, <i>Max</i>	0.05	Beyond this limit, the water becomes toxic	No relaxation	(see note)	To be tested when pollution is suspected
16	Zinc (As Zn). Mg/l, <i>Max</i>	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	39 of 3025: 1964)	To be tested when pollution is suspected
17	Anionic detergents (As	0.2	Beyond this limit it can cause a light froth in water	1	Methylene-blue extraction method	To be tested when pollution is suspected

S. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Altern	Methods of Test (Ref. To IS)	Remarks
	MBAS) mg/l, <i>Max</i>					
18	Chromium (As Cr ⁶⁺) mg/l, <i>Max</i>	0.05	May be carcinogenic above this limit	No relaxation	38 of 3025: 1964	To be tested when pollution is suspected
19	Poly nuclear aromatic hydrocarbons (as PAH) g/l, <i>Max</i>	-	May be carcinogenic above this limit	-	-	-
20	Mineral oil mg/l, <i>Max</i>	0.01	Beyond this limit undesirable taste and odour after chlorination take place	0.03	Gas Chromatographic method	-
21	Pesticides mg/l, <i>Max</i>	Absent	Toxic	0.001	-	-
22	Radioactive materials:				58 of 3025:01964	-
23	a) Alpha emitters Bq/l, <i>Max</i>	-	-	0.1	-	-
24	Beta emitters pci/1, <i>Max</i>	-	-	1	-	-
25	Aluminium (as Al), mg/l, <i>Max</i>	200	Beyond this limit taste becomes unpleasant	600	13 of 3025:1964	-
26	Aluminium (as Al), mg/l, <i>Max</i>	0.03	Cumulative effect is reported to cause dementia	0.2	31 of 3025: 1964	-
27	Boron, mg/l, <i>Max</i>	1	-	5	29 of 3025: 1964	-

Source: Indian Standard Drinking Water Specification-IS10500:1991

6.1.6 Noise Level Monitoring

The measurements for monitoring noise levels would be carried out at all designated locations in accordance to the Ambient Noise Standards formulated by Central Pollution Control Board (CPCB) in 1989 (refer [Table 6.3](#)) Sound pressure levels would be monitored on twenty-four hour basis. Noise should be recorded at a “A” weighted frequency using a “slow time response mode” of the measuring instrument. The location, duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan ([Table 6.3](#))

Table 6.3 Noise level standards (CPCB)

Type	Noise level for Day	Noise level for
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence zone	50	40
Day time - 6.00 am - 9.00 pm (15 hours)		

The monitoring plan along with the environmental parameters and the time frame is presented in the [Table 6.4](#).

Table 6.4 Environmental Monitoring Plan (*Terms of Reference No. 7 (xii)*)

S. No	Particulars	Monitoring Frequency	Standards	Duration of Sampling	Important monitoring parameters
Ambient Air Quality Monitoring					
1	Industry Main Gate, Eti Avalatandrapadu, Gondiparla villages	Quarterly	Air (Prevention and Control of Pollution) Rules, CPCB, 1994	24 hrs	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , & Chlorine
2	Work Place Monitoring Production area 3 locations, Chlorine Storage, HCl Storage, Product storage area, and ETP area	Quarterly		8 hr	SPM, VOC
Stack Emissions Monitoring					
1	Utility Stacks : 3 nos. Coal fired boilers, Incinerator and 5 no.s DG sets.	Quarterly	Air (Prevention and Control of Pollution) CPCB, 1994	--	PM, SO ₂ , Nox , recommended methods of CPCB.
Water Quality Monitoring					
1	Process water	Daily	Water Quality standards by CPCB	Grab	pH, TDS, SS, BOD, COD and Oil & Grease Hardness, , chlorides, using APHA or BIS analytical methods.

2	Effluents Stream wise	Quarterly		Grab	pH, TDS, SS, BOD, COD using APHA or BIS analytical methods.
3	Treated effluent after ETP	Daily		Grab	pH, TDS, TSS, COD, BOD and Oil and Grease using APHA or BIS analytical methods.
Noise Quality Monitoring					
1	Noise Levels at 3 Locations with in plant site and 2 locations outside the plant site , Avalatandrapadu, Gondiparla villages	Quarterly	Noise stan- dards by CPCB	24 hrs	Equivalent Noise levels in dB(A)
Soil Quality Monitoring					
1	Soil - 3 locations within the site; storage areas, near production area (3 places) and ETP area.	Once a year			pH, EC, CEC, Lead, Moisture, Texture, Bulk Density etc.

6.1.7 Responsibility of Monitoring And Reporting System

The overall responsibility of monitoring the above parameters shall lie with the management of SRAACL. The maintenance/environment wing shall be responsible for day to day monitoring of effluent, raw water and treated water quality. The Ambient air quality, Stack emissions, soil, noise and water quality shall be monitored by either third party or by the Environment management division of the unit.

Records shall be maintained for the analysis of raw effluents and treated effluents, ambient air quality data, stack emissions monitoring results, micro- meteorological data and noise levels. These records are not only required for the perusal of the Pollution Control Board authorities but also to derive at the efficiencies of the pollution control equipment as the objective of the project proponent is not only compliance with statutory regulations, but also a serious commitment towards clean environment.

The industry shall maintain the records as per the hazardous waste regulations and EPA regulations and apply for the annual consents for air and water, and renewal of authorization for the storage of hazardous waste as per Hazardous Waste (Handling & Management) Rules, 1989 and its amendmets. The records of hazardous waste manifest will be maintained.

Reporting system provides the necessary feedback for project management to ensure quality of the works and that the management plan in implementation. The rationale for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the project.

6.1.7.1 Work Zone Monitoring for Hazardous Chemicals *(Terms of Reference No. A.3)*

Periodic Workzone monitoring is adopted to review the indoor toxic chemicals concentration. The periodicity of monitoring is dependent on the concentrations i.e., below or above TLV values.

6.2 Environmental Monitoring Budget

The environmental budget for the various environmental management measures in the EMP is detailed in **Table 6.5**. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Costs. Moreover, since environmental enhancements have not been finalized at this stage, the table projects the typical costs unit wise.

Table 6.5 Environmental Monitoring Budget

Particulars	Monitoring Frequency	Unit Cost Rs.	Annual Cost Rs.
Ambient Air Quality Monitoring	Monthly	4500	162000
Work Place Monitoring	Monthly	2000	288000
Stack Emissions Monitoring	Monthly	2700	129600
DG Set Stack Emissions Monitoring	Quarterly	2700	54000
Process water	Daily	500	165000
Effluents - Stream wise	Quarterly	600	4800
Treated effluent (ETP water)	Daily	600	198000
Noise Level Monitoring	Quarterly	1000	20000
Soil Quality	Once a year	2000	20000
Total (Rs.)			1041400

7.0 RISK ASSESSMENT AND DAMAGE CONTROL

7.0 Introduction

This chapter presents the risk assessment study results for the plant operations, transport and storage of raw materials, and identifies maximum credible accident scenarios to draw the emergency management plan addressing various credible scenarios identified.

7.1. Objectives and Scope

The production of caustic and Synthetic Organic chemicals involves usage of many chemicals which are both hazardous and toxic in nature. The risks associated with the chemical industry are commensurate with their rapid growth and development. Apart from their utility, chemicals have their own inherent properties and hazards. Some of them can be flammable, explosive, toxic or corrosive etc. The whole lifecycle of a chemical should be considered when assessing its dangers and benefits. In order to ensure the health and safety of persons at or near the facilities, Govt. has approved some regulations.

The regulation requires Employers to consult with employees in relation to:

- Identification of major hazards and potential major accidents
- Risk assessment
- Adoption of control measures
- Establishment and implementation of a safety management system
- Development of the safety report

The involvement of the employees in identification of hazards and control measures enhances their awareness of these issues and is critical to the achievement of safe operation in practice. In order to comply with regulatory authorities, M/s Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) have entrusted Team Labs and Consultants, Hyderabad to review and prepare Hazard analysis and Risk assessment for their facility along with an approach to on-site emergency preparedness plan as required under the acts and rules. (Manual on emergency preparedness for chemical hazards, MOEF, New Delhi). In this endeavor, the methodology adopted is based on;

- visualizing various probable undesirable events which lead to major accidents

- detailed and systematic assessment of the risk associated with each of those hazards, including the likelihood and consequences of each potential major accident event; and
- identifying the technical and other control measures that are necessary to reduce that risk to a level that is as low as reasonably practicable

The strategy to tackle such emergencies, in-depth planning and person(s) or positional responsibilities of employees for implementation and coordination of timely and effective response measures are described in onsite detail in Emergency Plan.

7.2 Project Details

The plant site is located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The site is located at the intersection of 15° 49' 30" (N) latitude and 78° 4' 30" (E) longitude. The site elevation above mean sea level (MSL) is 300 m. The plant site is surrounded by open lands in east direction, Sree Rayalaseema Hi-Strength Hypo Limited (SRHHL) in north direction, Road connecting the NH-7 with Gondiparla village in the south and west directions. The nearest habitation from the plant is E.Tandrapadu village located at a distance of 0.5 km in northwest direction. The main approach road is NH-7 - Gondiparla village adjacent to the site in northwest direction. The nearest Town and Railway station is Kurnool at a distance of 3.5 km in northwest direction and nearest airport is Shamshabad located at a distance of 165 km in northeast direction. Tungabhadra River is flowing from northwest to southeast direction at a distance of 1.5 km in south direction. Interstate boundary between Telangana and Andhra Pradesh is at a distance of 1.3 km in northeast direction. There are two reserve forests in the study area. Gadidmadugu RF at a distance of 5.5 km in east direction. Pullaiah RF at a distance of 9.3 km in southwest direction. There are no National Parks, sanctuaries and critically polluted area within the impact area of 10 km

surrounding the site. Total site area is 152.40 ha. The manufacturing capacity is presented in **Table 7.1** Chemical inventory is presented in **Table 7.2**

Table 7.1 Proposed Manufacturing Capacity

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	--	50
7	Sodium Sulphate	TPD	--	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride*	TPD	7.6	7.6	15.2
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	--	10	10
2	Hydrochloric Acid (100 %)	TPD	--	8.27	8.27
IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	--	76
2	Power generation Furnace Oil**	MW	31	--	31
V. Oil and Fatty Acid Division					
1	Oil and Fatty Acid Products (Non EC Products)	TPD	498	--	498

*Carbon Tetrachloride (CCl₄) generated will be sold as a feed stock to Authorized users/excess will be incinerated.

** Shall be kept as standby.

Table 7.2 List of Raw Materials and Inventory (Terms of Reference No. 3(iv) & 3(v))

S. No	Name of Raw Material	Inventory (MT)	Mode of Storage	Physical Form
Chlor-Alkali				
1	Raw Salt	20000	Closed godown	Solid
2	Soda Ash	100	Covered Shed	Solid
3	Barium Chloride	25	Storage Tank	Liquid
4	Potassium Chloride	2000	Covered Shed	Solid
5	Hydrochloric Acid	650	MSRL tanks	
6	Chlorine	4 x 100	Pressure Vessels	Liquid
Chloromethanes				
1	Methanol	850	Storage Tanks	Liquid
2	Sulfuric Acid	130	Storage Tank	Liquid
3	Methylene Chloride	2 x 144.8	Storage Tank	Liquid
Chlorodifluoromethane				
1	Chloroform	2 x 166.4	Storage Tank	Liquid
2	Anhydrous Hydrogen Fluoride	8	Storage Tank	Liquid
3	Sulfuric Acid	2	Storage Tank	Liquid

7.3 Process Description

The manufacturing process for all the products is presented in Chapter 2. (Page No. 2-2 to 2-13) of the report.

7.4 Plant Facilities

The manufacturing facility shall be provided with

- | | |
|-----------------------------|--------------------------|
| 1) Production Area | 6) Tank farm area |
| 2) Utilities | 7) Chlorine Storage area |
| 3) Quality Control, R&D lab | 8) Administrative Office |
| 4) Effluent Treatment plant | 9) HCl Synthesis area |
| 5) Warehouses | |

The production facilities shall be designed for proper handling of materials and machines. Safety of operators and process parameter monitoring shall be the major points of focus in the design of facility. The current Good Manufacturing Practices (GMP) guidelines shall be incorporated as applicable.

7.4.1 Production Area: (Terms of Reference No. B.3)

Caustic/Pottash synthesis consists of

- i. Brine dechlorination, saturation and purification
- ii. Electrolysis of brine
- iii. Chlorine handling
- iv. Hydrogen Handling
- v. Hydrochloric gas synthesis
- vi. Caustic Evaporation and flaking

The following inter locks have been provided for safe operation at Chlor-Alkali Plant

1. Rectifier (PU-1010)

- a) Interlock-101 will stop polarisation unit(PU-1020) and open DM water addition valve (HV-121) to the electrolyzers when rectifier is on.
- b) Interlock-102 will start polarisation unit and close DM water valve to electrolyser if rectifier is stopped.
- c) Interlock-103 will trip the rectifier i) on and very low level of brine overhead tank and inter lock bypass switch in off position. ii) Emergency tripping from cell house/process control room/rectifier and iii) stoppage of chlorine blowers.
- d) Interlock-104 will stop H₂ blowers, open valve on Cl₂ line to hypo unit on rectifier failure.
- e) Interlock-111 will trip the rectifier on very high voltage in elements of the electrolyzers.
- f) Interlock-583A low level of brine overhead tank will trip the rectifier.
- g) Interlock-611 failure of chlorine blower will trip the rectifier.

2.PROCESS

- a) Interlock-211 the standby caustic catholyte circulation pump will start on auto of the running pump fails and if the stand by pump fails to start an alarm will sound at the control room.
- b) Interlock-411 the standby DM water pump will start on failure of running pump.

- c) Interlock-521/522 on failure of depleted brine pump the standby pump will start within 5 sec. and if this does not start the anolyte brine pump and feed brine pump will trip in 5 sec. With an alarm indication in DCS.
 - d) Interlock -581 the standby feed brine pump to overhead tank will start on auto if the running fails.
 - e) Interlock-724 high liquefaction pressure opens the vent valve to Hypo.
 - f) Interlock-2101 very low suction pressure of the Hydrogen blower will trip the blowers.
3. The electrolyser section is provided with DCS arrangement and indications, annunciators are available in the control panel.
 4. Field indicating instruments like Rotameters, Manometers, Pressure gauges, Temperature indicators are provided.
 5. The electrical installations, fittings conform to the area classification.
 6. The plant is being provided with a proper ringmain hydrant system with TAC approval.
 7. First aid fire fighting equipments like extinguishers are provided in requisite members.
 8. Respiratory protective appliances like self contained breathing apparatus, air line mask, cylinder air mask are provided especially in all the areas handling chlorine.
 9. Chlorine sensors/ alarms are provided in selected locations like chlorine storage, chlorine filling, chlorine neutralization tower outlet and at Northern side of HCl compound wall, HCl plant, Cell House, Old Dechlorination, Main Gate and Cogen Plant.
 10. Wind indicator is provided.
 11. Water seals are provided in Chlorine and Hydrogen headers and the seals, vents etc., in the Chlorine header are connected to the Hypo header.
 12. Usage of materials like FRP coated PVC, PVDF lines and valves for wet chlorine and corrosive services offers better life and reliability.

Manufacturing of Chlorormethanes consists of Hydrochlorination and Thermal chlorination will be carries out in closed reactor with all in-built safety measures and automatic cut-off valves and switches.

7.4.2 Utilities:

No additional utilities are proposed for expansion. The required steam will be met form existing coal fired boiler. It is proposed to establish standby DG sets of capacity 500 Kva in addition to existing stand by DG sets. The list of utilities is presented in the following **Table 7.3**.

Table 7.3 List of Utilities

S.No	Description	Existing	Proposed	Total after expansion
1	Coal Fired Boiler	110 TPH	-	110 TPH
		100 TPH	-	100 TPH
		45 TPH	-	45 TPH
2	DG Sets**	5 x 6.2 MW	-	5 x 6.2 MW
		1 x 160	-	1 x 160
		1 x 285	-	1 x 285
		1 x 400	-	1 x 400
		1 x 500	1 x 500	2 x 500
3	Oil and H ₂ fired boiler*	3 TPH	-	3 TPH
4	Waste Heat Recovery Boiler (WHRB) connected to DG sets*	3 TPH	-	3 TPH
5	Oil fired boiler*	3 TPH	-	3 TPH

* Shall be kept as standby

**DG sets will be used during load shut down periods only.

7.4.3 Quality Control, R&D Lab

The QC department shall comprise of an in-process lab with instruments like HPLC, GC etc. It will be maintained by highly qualified and trained people. The activities include:

- In-process quality check during manufacturing
- Validation of facilities
- Complaint handling

Also a process development laboratory shall be provided for in-house process development, initial evaluation of process technology in case of technology transfer, back-up for production department to address any issues arising during commercial production

7.4.4 ETP and Solid waste storage

The and ETP sludge and solid waste generated from process are sent to secured landfill within plant premises. Treated effluent will be reused for brine make-up and green belt development.

7.4.5 Ware Houses:

The plant shall have sufficient storage facility for safe handling of raw materials. All solid raw materials shall be stored in marked areas with proper identification. Liquid raw materials which are available in drums will be stored according to material compatibilities and flammability. Adequate fire fighting facilities shall be provided as per NFPA norms.

7.4.6 Tank Farm Area:

A separate tank farm area shall be provided for storing liquid raw materials with high inventory and also for toxic, corrosive chemicals. Dykes shall be provided to ensure safety in case of tank failure. Acid proof lining for the dykes shall be provided for acid storage tanks. Condensers for low volatile solvent storage tanks vents.

7.4.7 Cylinders storage Area:

Gas cylinders storage should conform to SMPV-Unfired rules-1981. Chlorine storage tanks are stored in a dedicated area with interlocks and continuous chlorine leak detection system monitoring system. Hydrogen cylinders should be stored in approved Gas Storage pad. Chained and capped when not in use. Operational cylinder should be firmly secured. Pressure regulator, metal piping, non-return valve, and safe residue bleed off arrangement should be incorporated in installation design. Strict hot work control and display of danger signs should be ensured.

7.4.8 Administrative Office:

An Administrative office shall be provided at the entrance of the factory to ensure the entry of authorized personnel only into the premises.

7.4.9 House Keeping:

A regular housekeeping schedule with adequate preventive maintenance shall be ensured so that the plant is consistently maintained as per GMP standards.

7.4.10 Facility layout and design:

The layout of all the various areas required for the facility, as mentioned above is considered. In laying out the above areas, isolation of the various process areas from the utilities and non-process areas is considered in view of both containment and cGMP. A tentative plant layout is shown in [Fig 7.1](#). Storage of chemicals and controls are presented in [Table 7.4](#).



Table 7.4 Storage of Hazardous Chemicals and Controls (Terms of Reference No. B.4 & A.12)

S.No	Name of Material	Quantity	Total Quantity	Type of Storage	Condition	Type of Hazards	Control Measures
1	Liquid chlorine	4 Nos ×100mts (1No empty tank)	300MT	MS Tank	Liquid under pressure(3.0kg/cmsq .temp.°C to 40c)	Toxic	Following provisor have been made field level indicatorH/H level alarm Low high pressure alarm in control room two rupture disc along with two safety valves on each side of tank outlet the safety valve led to Hypo.Each tank is provided with chlorine sensors and auto start facility of emg scrubbing system in case of Cl ₂ exceeds 5PPM.Another sensor is installed at Ground floor.
2	Hydrochloic Acid (32%)	3NosX290m3	870m3/ 1000mts	MSRL	Liquid at atmospheric pressure and temp.	Spill	Same as Sulphric Acid
3	Sulphuric Acid	1 NoX25m3	50m3/85mts	MS	Liquid at atmospheric Pressure & Temp.	Spill	Neutralizing & Flushing arrangement have been provided level Measuring device provided to prevent over flow of tank
4	Hydrogen	2NosX150m3	300m3	Gas Holder	Gas at 150mmwc at ambient temperature 18kg/cm ² pressure.	Fire.	Hydrogen release to water seal. Fire hydrant network provided
		1NoX100m3	100m3				
		3NosX18m3	54m3				
		2NosX22m3	44m3	Bullet			
5	Caustic Soda Lye	2NosX100m3	3120m3/ 2300mts	Vertical	Liquid at atmospheric pressure and temp.	Spill	Neutralizing & Flushing arrangement have been provided level Measuring device provided to prevent over flow of tank
		2NoX1600m3					
		1NoX700m3					
		1NoX450m3					
		1NoX550m3					

6	Caustic Potash	1NoX110m3	1385m3/ 500mts	Tank Farm		Spill	Neutralizing & Flushing arrangement have been provided level Measuring device provided to prevent over flow of tank
		2NoX250m3					
		1NoX350m3					
		1NoX450m3					
7	Caustic Soda Flakes/Caustic Potash Flakes.	-----	-----	Ware House	Solid inHDPE bags at ambient Condition	Spill	Packed in air tight bags to prevent spillage store in ware house which is a closed building. Adequate measure for safe handling are taken
8	Methylene chloride	2 x 144.8M3	289.6M3	MS Vertical	Liquid at atmospheric pressure and temp	Fire	Fire hydrant network provided with Foam arrangement.
9	Carbon Tetra Chloride	51M3	51M3	MS Vertical		Fire	
10	Chloroform	2 x166M3	332M3	MS Vertical		Fire	
11	Methanol	1 x155M3	1261M3	MS Vertical		Fire	
		2 x 553M3					

7.5 Maximum Credible Accident and Consequence Analysis (MCACA)

The potential hazards due to toxic and inflammable nature of the raw materials, process streams and products can be quantified. However, it is necessary to carry out a hazard analysis study to visualize the consequences of an unexpected release from chemical plant, which consists of a number of process units and tank farm facilities. The present study provides quantified picture of the potential hazards and their consequences.

7.5.1 Methodology

MCACA aims at identifying the unwanted hazardous events, which can cause maximum damage to plant and personnel. At the first instance, all probable accident scenarios are developed. Scenarios are generated based on properties of chemicals, physical conditions under which reactions occur or raw materials stored, as well as material strength of vessels and conduits, in-built valves and safety arrangements, etc. Creating a scenario does not mean that it will occur, only that there is a reasonable probability that it could. A scenario is neither a specific situation nor a specific event, but a description of a typical situation that covers a set of possible events or situations.

This is the basis of the risk study; it tells us what may happen so that ways and means of preventing or minimizing the possibility can be devised. The next step is estimation of the probability of each accident scenario. A credible accident is one within the realm of possibility and is likely to be severe enough to cause significant damage. This concept comprises of two parameters- probable damage caused by an accident and probability of occurrence of an accident. There may be types of accidents that may occur frequently, but would cause very little damage. And there may be other types that may cause great damage, but would have a very low probability of occurrence. Both are important and need to be considered, even if they are later discarded. A host of probable accident scenarios are visualized examined and credibility of probable events is established based on engineering judgment, past accident data and expertise in the field of risk analysis.

The following steps are involved in identifying the maximum credible accident scenarios.

- a. A detailed study of the process and plant information including process flow diagrams and piping & instrumentation diagrams.
- b. Hazard classification of chemicals, operations and equipment.
- c. Identification of representative failure cases of vessels and pipelines and the resulting release scenarios
- d. Establishment of credibility of visualized scenarios based on past accident data.

7.6.2 Identification of Vulnerable Areas

The unit operations in the process and storage areas involve mass and energy transfer operations to effect the necessary physical changes. Nature of chemicals and the operating conditions create special hazardous situations. In the present case the chemicals handled are flammable and toxic in nature. With these factors in mind a thorough examination of the process information is carried out and a list of inventories of the hazardous chemicals is prepared to identify the hazardous situations. Based on the raw material consumptions determined from the pilot scale studies, experience in handling commercial scale processes and logistics in procurement of raw materials, the inventories to be maintained for each of the raw material and its mode of storage is determined. High inventory liquid raw materials are usually stored in tank farms, while solids and other low inventory liquids are stored in ware house based on compatibility, reactivity, toxicity etc. with appropriate safety and fire fighting facilities to handle any kind of emergencies. The solvent tank farm and the capacity of each tank is mentioned in table 6.4.

7.5.3 Representative Accident Scenarios

A study of past accidents, which took place in similar process units and the present plant, provides reasons and course of accidents and there by focusing on most critical areas. A thorough examination of engineering details indicated many possible scenarios like gasket leak, pinholes in pipes and vessels apart from rupture of pipelines and vessels and catastrophic failure of vessels resulting in a pool. Heat radiation damage distances for Pool fire was considered.

Failure Frequency:

The release scenarios considered above can be broadly divided in to two categories

- (i) Catastrophic failures which are of low frequency and
- (ii) Ruptures and leaks which are of relatively high frequency

Vapor or liquid release from failure of gasket, seal and rupture in pipe lines and vessels fall in second category whereas catastrophic failure of vessels and full bore rupture of pipe lines etc., fall in to first category. Typical failure frequencies are given in **Table 7.5**.

Table 7.5 General Failure Frequencies

Item	Mode of failure	Failure frequencies
Pressure Vessel	Serious leak	1.0×10^{-5} /Year
	Catastrophic	3.0×10^{-6} /Year
Pipe lines		
=50 mm dia	Full bore rupture	8.8×10^{-7} /m.year
	Significant leak	8.8×10^{-6} /m.year
>50 mm =150 mm dia	Full bore rupture	2.6×10^{-7} /m.year
	Significant leak	5.3×10^{-6} /m.year
>150 mm dia	Full bore rupture	8.8×10^{-8} /m.year
	Significant leak	2.6×10^{-6} /m.year
hose	Rapture/Failure	4.0×10^{-5} /hr
Unloading arm	Rapture/Failure	3.0×10^{-8} /hr
Check valve	Failure on demand	1.0×10^{-4} /on demand
motor operated valve	Failure on demand	1.0×10^{-3} / on demand
Flange	Leak	3.0×10^{-4} / Year
Pump seal	Leak	5.0×10^{-3} / Year
Gasket failure	Failure	5.0×10^{-5} / Year
Process safety valve(PSV)	Lifts heavily	4.0×10^{-3} / Year
	Blocked	1.0×10^{-3} / Year
	Lifts lightly	6.0×10^{-2} / Year

7.6 Consequence Analysis

The accidental release of hazardous chemicals leads to subsequent events, which actually cause the damage. The damages are of three types.

- 1) Damage due to heat radiation.
- 2) Damage due to Over pressure effects subsequent to explosion
- 3) Damage due to toxic effects

The type of damage and extent of damage depends on nature of chemical, the conditions of release, atmospheric conditions and the subsequent events. The sequence of probable events following the release of a hazardous chemical is schematically shown in [Figure 7.2](#). The best way of understanding and quantifying the physical effects of any accidental release of chemicals from their normal containment is by means of mathematical modeling. This is achieved by describing the physical situations by mathematical equations for idealized conditions and by making corrections for deviation of the practical situations from ideal conditions. In the present study ALOHA software from USEPA. These models for various steps are described in the following sub-sections.

7.6.1 Release Models and Source strength

This depends on the nature of failure of the unit and the content of the unit and operating temperature and pressure of the unit. The release may be instantaneous due to total failure of storage unit or continuous due to leakage or rupture of some component of the storage facility. The material discharged may be gas or liquid or the discharge could be manifested through two phase flow. The models that are used to calculate the quantity of liquid/vapor released are:

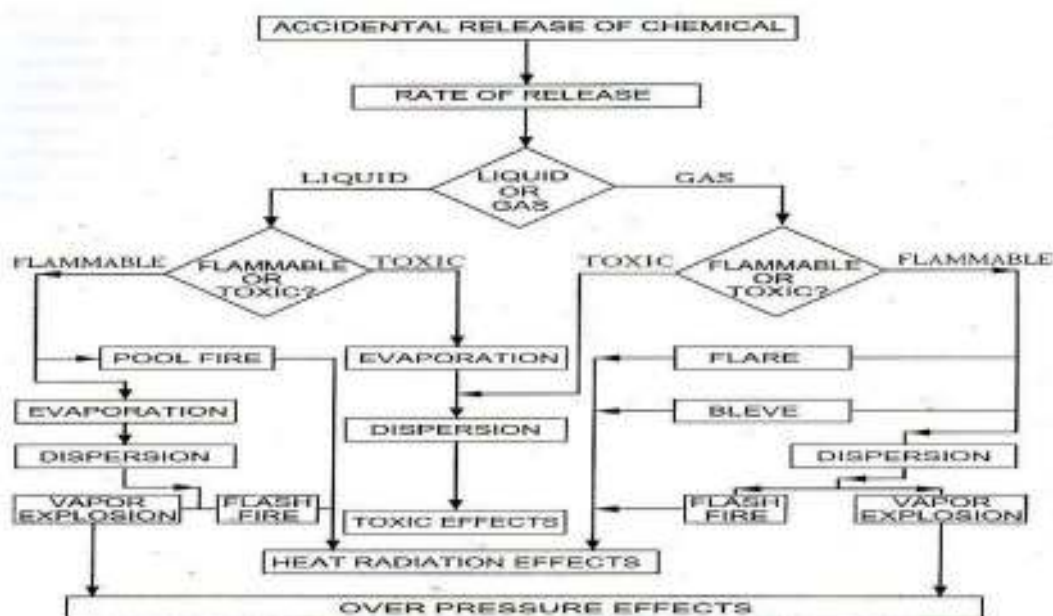


Fig 7.2 Steps in Consequence Calculations

The following criteria tables present heat radiation intensities (**Table 7.6**), radiation exposure and lethality (**Table 7.7**), and damage due to peak over pressure is presented in **Table 7.8**.

Table 7.6 Damage Due to Incident Radiation Intensities

S. No	Incident Radiation (KW/m ²)	Type of Damage Intensity	
		Damage to Equipment	Damage to the People
1	37.5	Damage to process Equipment	100% lethality in 1 min. 1% lethality in 10 sec.
2	25.0	Minimum energy required to ignite wood at indefinitely long exposure without a flame	50 % lethality in 1min. Significant injury in 10 sec.
3	19.0	Maximum thermal radiation intensity allowed in thermally unprotected adjoining equipment.	---
4	12.5	Minimum energy to ignite with a flame, melts plastic tubing	1% lethality in 1 min.
5	4.0	--	Causes pain if duration is longer than 20 sec, however blistering is unlikely (First degree burns)
6	1.6	--	Causes no discomfort on Longer exposure

Source: Techniques for Assessing Industrial Hazards by World Bank

Table 7.7 Radiation exposure and lethality

Radiation Intensity (KW/m ²)	Exposure Time (seconds)	1% Lethality	Degree Burns
1.6	--	0	No Discomfort even after longer exposure
4.5	20	0	1st
4.5	50	0	1 st
8.0	20	0	1 st
8.0	50	<1	3 rd
8.0	60	<1	3 rd
12.0	20	<1	2 nd
12.0	50	8	3 rd
12.5	--	1	--
25.0	--	50	--
37.5	--	100	--

Table 7.8 Damage Due to Peak Over Pressure

Human Injury		Structural Damage	
Peak Over Pressure (bar)	Type of Damage	Peak over Pressure (bar)	Type of Damage
5 – 8	100% lethality	0.3	Heavy (90% Damage)
3.5 – 5	50% lethality	0.1	Repairable (10% Damage)
2 – 3	Threshold lethality	0.03	Damage of Glass
1.33 – 2	Severe Lung damage	0.01	Crack of Windows
1 – 1 ^{1/3}	50% Eardrum rupture	-	-

Source : Marshall, V.C.(1977)' How lethal are explosives and toxic escapes.

7.6.2 Results of Consequence Analysis

The damages due to the accidental release of chemicals are of three types.

- Damage due to heat radiation
- Damage due to Over pressure effects subsequent to explosion
- Damage due to Toxic effects

7.6.2.1 Analysis of Hazardous Scenarios

The hazardous chemicals involved are stored within the threshold limits of storage and hence few representative chemicals were studied.

7.6.2.1.1 Heat radiation effects

When a non-boiling liquid spills, it spreads into a pool. The size of the pool depends on the availability of the bund and obstacles. The heat load on objects outside a burning pool of liquid is calculated with the heat radiation model. The average heat radiation intensity, the diameter-to-height ratio dependent on the burning liquid, geometric view, distance from the fire, relative humidity of air, horizontal or vertical orientation of the object radiated with respect to fire are factored. All storage tanks in tank-farm area are provided with dykes. For each of the hazardous chemicals involved various scenarios such as pipe line leaks of 5mm or pipeline ruptures or catastrophic vessel ruptures of the inventories as outlined have been considered and damage distances for Lower Flammability Limits (LFL) and heat radiation effects for the three levels of intensity are calculated and presented in [Table 7.9](#) . Heat radiation damage distances for most of the scenarios are not occurring in the case of release from 25 mm holes at a height of 0.1 m from the bottom

of the tank for one hour, in the storage tanks. In case of pipeline leaks, 5 mm leaks are considered for 15 mm and 50 mm pipe sizes. The release rates from 5 mm leaks are observed to be low, and these leaks have low incident hazard. The concentration of the flammable material in the vapor cloud was found to be below the lower flammability limits.

Table 7.9 Heat Radiation Damage Distances - Tank Farm

S. No	Name of Raw material	Tank Capacity (KL)	Storage Tank Dimension		Hole Dia (mm)	Release Rate (Kg/sec)	Heat radiation damage distances in m for KW/m ²		
			Height (m)	Dia (m)			37.5	12.5	4.0
1	Methanol	1 x 760	11	8	25	0.38	--	--	4.73
2	Methyl Chloride	1 x 15	2.3	3.8	25	2.07	--	--	12

Table 7.10 Heat Radiation Damage Distance - Hydrogen Cylinders

S. No.	Scenario Description	Release Rate Kg/sec	Storage Tank Details			Heat radiation damage distances in m for KW/m ²		
			Height (m)	Dia (m)	Storage Pressure	37.5	12.5	4.0
1	Hydrogen Gas Cylinder (50Kg)	5.42	0.87	0.27	350 Bar	<10	12	20

7.6.2.1.2 Toxic Dispersion:

The storage of toxic chemicals was evaluated with respect to failure of containment resulting in toxic dispersion and the toxic damage distances were calculated using ALOHA software. The results of the same are presented in [Table 7.11](#).

Table 7.11 Toxic Dispersion Damage Distances

S. No.	Scenario Description	IDLH (ppm)	Release Rate Kg/sec	Distance (m)	Storage Tank Details			
					Height (m)	Dia (m)	Total Volume (m ³)	Storage Pressure
1	Chlorine (Liquid Storage)	10	14.63	4900	12.5	3.2	100	Atmospheric
2	Chlorine Tonner	10	0.30	640	2.1	0.8	1	7atm
3	30% Hydrochloric Acid (Puddle)	50	0.01	42	8.248	6.7	300	Atmospheric

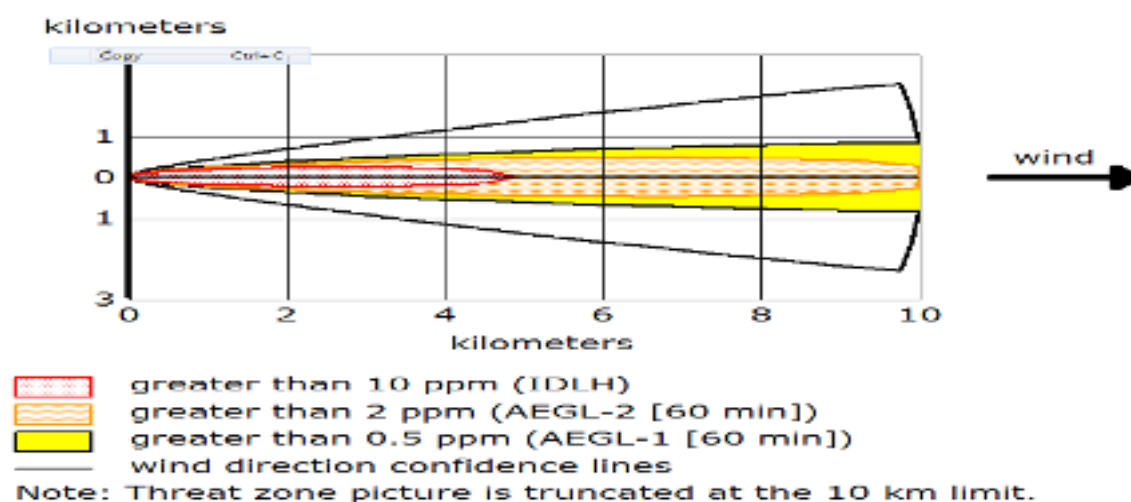


Fig 7.3 Toxic Dispersion Radiation Damage - 100 m³ Liquefied Chlorine Tank

7.6.2.1.3 Overpressure effects:

When an unignited gas cloud mixes with air and reaches the flammable range and if the cloud ignites wither a flash fire or flash fire explosion can occur. Since the burning time is shorter, instead of heat radiation from a flash fire, peak overpressure as a function of distance from the centre of the cloud is derived. In case of pipeline leaks, damage distances due to overpressure effects are not observed. The values are found to be similar as there are no pressurized storage tanks in the tank farm, and the over pressure distances are contingent on the tank capacity.

7.6.3 Observations:

From the previous incident records published in literature and hydrocarbon release data bases, it has been observed that pinhole leaks contribute highest percentage where as the second cause is small sized leaks of 25 mm diameter in tank farm. Accordingly the consequence analysis was carried out for 25 mm sized leaks in the tank farm.

7.6.4 Recommendations:

The following are the recommendations to minimize the hazards and improve the safety of the proposed plants. Plants of this nature, which handle a variety of chemicals, face

problems of fire and vapor cloud explosions. It has been observed that for the proposed plants the damage distances are more or less confined to the plant area only. Taking precautionary safety measures as outlined below can further minimize these effects.

- In view of hazardous nature of operations, it is recommended to adopt best practices with respect to design, operation and maintenance.
- It is recommended that all flammable areas and process area be maintained free of ignition sources. Ensure that sources of ignition, such as pilot lights, electrical ignition devices etc., at strategic locations like chemical storage areas are avoided.
- All electrical fittings involved in and around the pipeline and operation system should conform to flame/explosion proof regulations.
- Strict hot work control and display of danger signs should be ensured.
- It is recommended to provide one fire hydrant point in the tank-farm area to take care of any emergency. Installation of fire water hydrant net work is suggested.
- It is suggested to provide fire extinguishers in process plant at chemicals storage area and the vents of chemicals storage to be provided with PESO approved flame arrestors.
- Fire protection equipment should be well maintained so that it is available when required. They should be located for quick accessibility. Provide carbon dioxide fire extinguishers and DCP extinguishers for Electrical fires.
- It is suggested to have a periodical review of safety awareness and safety training requirements of plant employees with respect to hazards present in the plant.
- In general, all pipelines carrying flammable liquids/vapor are periodically checked for their integrity. Spillages have to be avoided and disposal should be done quickly.

7.6.5 Toxic Management Plan *(Terms of Reference No. A.13 & B.22)*

Handling: Storage & handling in compliance with MSDS. The transfer of raw materials shall be mainly by closed pipeline systems, while chemicals stored in drums are transferred from drums by using air operated diaphragm pumps in closed hoods.

I. Chlor-Alkali Plant

In chloro-alkali plant the gaseous emissions are chlorine and hydrogen chloride vapours. Due to advancement of control checks and due to membrane cell electrolysis, possibility of chlorine emission to atmosphere is negligible. Scrubbing systems are provided to neutralize sniff gases effectively. Even the dilute chlorine is also being converted to sodium hypochlorite after neutralisation with caustic soda at control temperature leading to value addition.

(a) Chlorine Emissions

The sources of chlorine emissions are cell house, Dechlorination unit, chlorine liquefaction and chlorine storage and filling.

Cell House

Cell house is equipped with safety inter locks, safety blow out seals, etc. Either during power failure or due to any miss operation chlorine is diverted to neutralisation unit automatically. Cell house emissions will not change after the expansion as the emissions in this section are due to failure of systems only.

Dechlorination Section

Brine after electrolysis which is called depleted brine contains about 0.3 g/l of dissolved chlorine. Since we have installed Vacuum Dechlorination system, it is suck the dissolved gas in enriched form to main chlorine header instead of blowing it to neutralisation unit. This will help to effectively liquefy all the chlorine instead of sending it neutralisation unit. This will facilitate reduction in chlorine diversion to neutralisation. Hence after expansion there will not be any emission from this operation but there will be some additional economic benefits.

Chlorine Liquefaction Section

Chlorine is generated during electrolysis as a co-product. 70% of chlorine is being liquefied and sold as liquid chlorine. After cooling, the chlorine is blown to drying unit to eliminate moisture, compressed in compressors and diverted to liquefier wherein it gets

liquefied. During liquefaction, depending upon gas purity, 95% of chlorine gets liquefied and the balance quantity comes out as sniff gas and the same will be burnt in hydrochloric acid synthesis unit.

The industry is supplying Hydrogen chloride gas to a down stream unit to manufacture chlorosulphonic acid. All the sniff chlorine from chlorine liquefaction, containing about 10MT of chlorine, is burnt in synthesis unit to make Hydrogen Chloride gas instead of sending it to neutralization. In spite of increase in liquid chlorine production, all the sniff chlorine can be utilized effectively and safely as is being used now in the manufacture of Hydrochloric Acid. So there is no additional load on neutralization.

Chlorine storage filling and handling

For chlorine storage, four tanks of 100 MT capacities are available. One tank is always kept as dump tank, chlorine sensors are installed near each tank with an indication in control room to alert all, in time, in case of any leakage. Load cells are provided for indication of tank weight locally as well as in control room. Excess level alarm, excess flow shut-off valves, gas masks, etc., have been provided in storage area.

In filling section also, chlorine sensors are provided to sense leakage of chlorine. Load cells to allow correct filling of chlorine tonners are provided. Scrubbing system around the filling section to take care of accidental emissions is in operation. Apart from this, emergency kits, gas masks and trained man power are available round the clock.

To avoid chlorine storage risk totally, the industry has commissioned a scrubbing system exclusively for chlorine storage and filling area, to take care of any accidental emission and to avoid spreading of chlorine to nearby area. Arrangements are also being made to take back left over liquid chlorine, after filling, to liquefaction unit for reprocessing to reduce load on neutralisation unit.

Initially, chlorine neutralization was with milk of lime and the resultant bleach liquor was supplied to nearby paper mill. After its closure, the industry has switched over to scrubbing with caustic. Now the industry has three caustic scrubbing towers in series.

With available facilities and expertise in handling chlorine, chlorine emissions to atmosphere are being maintained between 0.6 to 1 ppm in vents. These levels are well below the prescribed limits. The industry has provided seven chlorine sensors at critical places like chlorine storage and filling, hypo plant. Some sensors have recording facility.

Normally chlorine goes to neutralisation from chlorine filling and brine Dechlorination. In case of either process problems or power failure, release of chlorine to neutralisation unit takes place. Chlorine neutralisation unit is provided with emergency power supply to run in case of power failure and also one blower and one caustic circulation pump are exclusively provided with Diesel engine to run in case of failure of emergency supply also. The resultant Sodium Hypo is a value added product, since it is being used in many oxidation reactions. A dedicated chilled water system is also provided to take care of heat of reaction during neutralisation and to make a quality product. There will be marginal increase in chlorine to neutralisation from filling. But as the total quantity of chlorine will be the same, the industry shall be in a position to maintain total scrubbing keeping the outlet emission well below stipulated specification.

A chlorine sensor is also provided at final neutralisation tower outlet to monitor the chlorine emission to atmosphere after neutralisation. Due to double absorption, chlorine emission from scrubber outlet is below stipulated limits. Since there is no further load on neutralisation unit, emission of chlorine to atmosphere will continue to be well below prescribed limits. With available safety precautions, equipment and skilled manpower, practically there will not be any additional chlorine emissions to atmosphere even after expansion. The quantity of chlorine generated, captive usage and salable product is presented in [Table 7.12](#). Chlorine storage tanks and interlock system photographs are presented in [Fig 7.4](#).

Table 7.12 Details of Quantity of Chlorine

S.No	Description	Quantity (TPD)		
		Existing	Proposed	Total after expansion
1	Total Chlorine Generated	460	440	900
2	Chlorine for captive usage			
	a. Hydrochloric Acid	155	135	290
	b. Sodium Hypochlorite	5	5	10
	c. Liquid Chlorine	300	300	600
	Liquid Chlorine Distribution			
	a. Chloromethane	130	130	260
	b. Sree Rayalaseema Hi-Strength Hypo Ltd.	150	50	200
	c. Domestic Market	20	120	140
3	Total Chlorine Storage Capacity (MT)	4 x 100	--	4 x 100*

Note:

1. However chlorine to HCl and liquid chlorine production will vary according to market demands.
2. To consume additional chlorine produced from proposed expansion, it is proposed to promote entrepreneurs to establish chlorine derivate products like CPW.

* 1 x 100 MT kept empty to transfer the material from other tank in case of emergency. The excess chlorine will be sold as product.



Fig 7.4 Chlorine storage tanks and Interlock system

II. Chloromethanes Plant

(a) HCl Absorption

Majority of the HCl gas produced from thermal chlorination unit is used to produce methyl chloride. Excess HCl available is absorbed in HCl absorber to produce 32% HCl. To avoid emissions from HCl absorber, tail gas vents are connected to a tail gas tower followed by organic stripper to remove organics. To avoid emissions in the plant, tail gas vents are connected to a venturi scrubber and the lean acid formed is used for absorption of Hydrogen chloride gas in absorber. With this modification, the possibility of HCl gas emission to atmosphere is totally curtailed. Apart from this, all vents of hydrochloric acid storage tanks and receivers also have been connected to water ejector to avoid emissions. The HCl gas emissions from all the vents are less than 10 mg/Nm³ which is within the prescribed limit.



Scrubbing System for HCl generated from Chloromethane

III. Incineration of Carbon Tetra Chloride and Waste Streams *(Terms of Reference No. A.11)*

The liquid waste streams generated from chloromethanes manufacture are mixed and stored in a day tank and pumped using a metering pump to fuel oil cum liquid waste burner located on the incinerator. The waste liquid consists of mostly all chlorinated compounds.

Incineration System

The furnace is followed by absorption system, scrubbing system and stack.

Liquid Incineration Chamber

This is vertical, cylindrical down fired furnace lined with refractory and insulating material. The common liquid waste is incinerate through a forced draft, steam atomized multi fuel burner. The produces short, high intensity flame and ensures efficient mixing with air and oxidation of the organic compounds in the waste liquid. Fuel oil, diesel is fired to the same burner during initial heat up and as required to maintain high temperature of incinerator.

Organics in the waste are completely decomposed and oxidized to form CO_2 , H_2O and HCl with minimum free Cl_2 under strong oxidation atmosphere, high temperature and turbulence. Extra steam is added directly in the incinerator to ensure that the equilibrium is maintained in favor of HCl formation, which is important to maximize the recovery of HCl from flue gas and minimize free Cl_2 , which also needs to be removed before discharge. The high temperature of 1400°C also ensures oxidation of hydrocarbons, which is important to avoid formation of toxic compounds when flue gas cools down. Conditions in the incinerator are controlled closely to ensure constant efficiency of incineration.

Absorption Section (HCl Stripper)

Flue gas from incinerator at 1400°C enters absorption section where the HCl in the flue gas is absorbed in a falling film type co current absorber using HCl solution. Main quench cooler is in shell and tube construction with falling film HCl absorber with cooling tower on service side. Tube and tube sheet is in impressive graphite construction. Cooling water is circulated in shell side while flue gas flows through tubes. In the top portion, HCl

solution from tail gas / packed tower is introduced in the tubes through liquid distributor where the HCl from the flue gases is absorbed by the liquid flowing through the tubes. The liquid forms a thin film on the tubes. The absorption being exothermic process, heat is removed by circulating cooling tower from shell side. The last section is packed bed saturator, which provides enough residence time to reach saturation temperature. The liquid gets concentrated to 18-20% HCl from the flue gases. At the bottom of the absorber integral recirculation tank along with recirculation pump is provided where part of 18-20 % HCl solution is circulated in tail gas packed bed tower. Recovered HCl 18-20 % solution.

Tail Gas Absorber

Tail gas absorber is a packed bed tail gas tower. The unabsorbed gases from quench absorber are passed through this tail gas packed bed tower which has packing's for maximum absorption of HCL. The part residual HCL not absorbed in the above absorber are further absorbed with the help of DM water and HCL solution. Thus weak acid generated due to this is then sent to quench cooler absorber as inlet. The flue gases from tail gas absorber are then sent to a final polishing scrubber.

Scrubbing Section

Remaining HCl and Cl_2 in flue gas is removed by absorption in alkali solution (5% caustic solution) in a scrubber. It is a packed column installed directly on top of tail gas tower but isolated by a chimney tray. Reducing agent in the form of sodium sulfate solution (5% solution) is also added along with alkali solution to decompose NaCl and Na_2SO_4 (at 5% solution) is discharged as bleed from the recirculation tank of the scrubber.

Stack

The clean flue gas is exhausted to the atmosphere through a stack at 30m elevation. The stack is also mounted above packed tower. The entire system operates on a force draft generated by combustion air fan to overcome pressure drop in the system. The

combustion air fan also provides continuous cooling air for furnace mountings. Photographs of Incineration system is presented in [Fig 7.5](#)



Fig 7.5 Incineration System for CCl₄

Engineering Control Measures: All the operations drying, distillation, separation is conducted in closed conditions. Automatic cut-off valves, switches are provided for control addition and separation. Vent condensers in series with chilled water circulation to distillation columns of CMS plants to mitigate atmospheric emissions of toxics.

Personnel Protective Equipment: Personal protective equipment shall be provided to all employees including contract employees. All the employees shall be provided with gumshoe, helmet, masks, goggles. The other equipment like ear muffs, gloves, respirators, aprons etc., will be provided to employees depending on the work area allocated to them. The PPE selection shall strictly follow the prescribed guidelines of MSDS.

Health Monitoring of Employees: The pre employment screening and periodic medical examination shall follow the guidelines of factories act. The pre employment screening

shall obtain medical history, occupational history followed by physical examination and baseline monitoring for specific exposures.

Pre employment check up will be made mandatory and following test will be conducted:

- **Plan of evaluation of health of workers**

- Chest x rays
- ECG
- Haemogram (examination of the blood)
- Urine (Routine and Microscopic)
- Complete physical examination
 - Musculo-skeletal disorders (MSD)
 - Backache
 - Pain in minor and major joints
 - Fatigue, etc.

Frequency of Health Monitoring

Occupation	Type of evaluation	Frequency
Process area	Dermatology examination, ophthalmic examination, ENT examination, physical examination, complete blood picture, complete urine examination, ECG, Random blood sugar, Lipid profile, Liver function test, kidney function test, Anemia profile, thyroid stimulating hormone, abdomen ultra sound scanning, thread mill test, Spirometry test.	Once a year for regular employees. Half yearly for contract employees
Noise prone areas	Audiometry	Annually

7.7 Transportation

All the raw materials and finished products are transported by road. Dedicated parking facility is provided in an area of 2550 sq.m for transport vehicles. There will be 230-250 truck trips per day to the factory. Traffic signs are placed in the battery limit. The drivers of the vehicles will be provided with TREM cards and will be explained the measure to be adopted during various emergencies.

The truck trips shall be staggered to ensure the maximum 20 truck trips per hour. It is also proposed to avoid material transport to and from the plant during 8 to 10 AM and 4 to 6 PM. It is also proposed to utilize returning trucks for product/ waste transport to reduce the number of truck trips.

Transportation of raw materials may result in accidents due to high speed collision, low speed collision, overturning and non-accident-initiated release. The initiating and contributing causes are presented in **Table 7.13**

Table 7.13 Truck Incidents – Initiating and Contributing Causes

Human Errors	Equipment Failures	System or Procedural Failures	External Events
Driver Impairment Speeding Driver Overtired Contamination Overfilling	Non-dedicated trailer RR crossing guard Failure Leaking Valve Leaking Fitting	Driver incentives Driver training Carrier selection Container Specification Route selection	Vandalism/ Sabotage Rain Fog Wing Flood/washout
Other Vehicle's Driver Taking Tight	Brake Failure Insulation/Thermal Protection Failure	Emergency response training Speed Enforcement	Fire at rest areas/parking areas Earthquake
Unsecured Load	Relief device failure Tire failure Soft shoulder Overpressure Material defect Steering failure Sloshing High center of gravity Corrosion; Bad Weld; Excessive Grade Poor Intersection design Suspension system	Driver rest periods Maintenance Inspection Time of day Restrictions	Existing accident

7.8 Disaster Management Plan *(Terms of Reference No. 7(xiii) & A.22)*

7.8.1 Introduction

A disaster is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering and, as a result, need protection, clothing, shelter, medical and social care and other necessities of life.

Disasters can be divided into two main groups. In the first, are disasters resulting from natural phenomena like earthquakes, volcanic eruptions, storm surges, cyclones, tropical

storms, floods, avalanches, landslides, and forest fires. The second group includes disastrous events occasioned by man, or by man's impact upon the environment. Examples are armed conflict, industrial accidents, radiation accidents, factory fires, explosions and escape of toxic gases or chemical substances, river pollution, mining or other structural collapses, air, sea, rail and road transport accidents and can reach catastrophic dimensions in terms of human loss.

There can be no set criteria for assessing the gravity of a disaster in the abstract since this depends to a large extent on the physical, economic and social environment in which it occurs. However, all disasters bring in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured, medical and social care, removal of the debris, the provision of temporary shelter for the homeless, food, clothing and medical supplies, and the rapid re-establishment of essential services.

An emergency may be said to begin when operator at the plant or in charge of storage of hazardous chemicals cannot cope up with a potentially hazardous incident, which may turn into an emergency. The emergencies could be a major fire or explosion or release of toxic gas or a combination of them.

The proposed plant will store fuels, which are flammable in nature, and the storage will be as per the Controller of Explosives and OISD norms. The hierarchy of the employees is yet to be determined and the project is still in the initial stages of designing. Hence a tentative disaster management plan is prepared to be suitably modified before commissioning of the plant.

7.8.2 Objectives of Emergency Management Plan (ON-SITE)

A quick and effective response during emergency can have tremendous significance on whether the situation is controlled with little loss or it turns into a major emergency. Therefore, the objectives of this Onsite Emergency Plan (ONSEP);

Scope of the OSEP.

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

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.

Main Objectives of On-Site Emergency Plan.

1. To save the lives of the plant personnel.
2. To minimise the effects of the accident on people and property.
3. To take steps to fight fire or to contain leaks or spills in the early stages so that it doesn't escalate into off site emergencies.
4. To control and localize the emergency.

Steps to minimize the effects will include First aid, Rescue, Evacuation and Rehabilitation apart from controlling the origin of emergency.

Elements of on-site emergency plan

Detailed **objectives** will be as follows:

1. Control of the occurrence, limiting & localizing 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 operations 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.
9. Inform employees & general public in vicinity about the role to be played by them in the event of an emergency.
10. In case of Flood, earth quake or cyclone, evacuation of the employees or contract labours is to be carried out in such a way that minimum employees or contract labours will remain in the premises to run the plant shut down, if required during above emergency to be done with consent of key personnel.

SAFETY MANAGEMENT SYSTEM *(Terms of Reference No.A.20)*

- Pipe lines in Chlorine services is regularly inspected visually, joints are tested with ammonia, thickness is measured and replaced at an interval of 3 years.
- Membrane leakage identification system is installed to ensure timely repair.
- A well organised safety dept., with a senior person at the level of G.M (Safety) is head of the department. Safety Officer and graduate trainees are available to oversee the safety function.
- Safety permit for jobs are being issued.
- Green belt around the factory is being maintained.
- Hypo plant is connected on emergency power with design capacity of 100% absorption of Chlorine. D.G operated direct driven Blowers and pumps are available apart from emergency power from emergency D.Gs.
- Lean brine and other water sources are being collected and being recycled for brine make up.
- Company has been consistently taking steps to reduce the pollutants. From the solid waste Barium Sulphate being recovered for sales.

- The floor washing are treated in the treatment plant and the treated water is used for tanker cleaning and gardening etc.
- Statutory testing being followed.
- Very high capacity Emergency Scrubbing system is installed to neutralise chlorine in
- case of storage tank leakages and the suction is extended up to chlorine filling unit also

IDENTIFIED EMERGENCIES HAVING ON SITE POTENTIAL

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

Toxic Release

a) Release of Chlorine gas from various process locations, storage, filling, transfer thro' pipeline and leak from tonners stored & loaded in trucks within the plant leading to toxic dispersion.

Fires & Explosions involving Hydrogen or Fuels

Hydrogen gas can leak from various process locations, gas holders, compressors, intermediate storage pressure vessels and pipe lines leading to jetfires, vapour cloud explosions and BLEVE.

EMERGENCY ORGANISATION

List of Key Personnel

Executive Director (Technical) shall be the Site Controller for the entire plant. As per the area and nature of accident they will take charge to discharge their duties. HOD (Prod) / HOD (F.A) / HOD (CMS) shall be Incident Controller for C.S. division, O&F division and CMS plant respectively.

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

Essential Employees

Supervisors of Chlorine Plant, Control room and Oil & Fats Division, Chloromethanes plant, D.G. Set Operator, River water pump Operator, Safety and Security Guards on duty, Drivers, Electricians, Instrument technician, Mechanical Fitters, First Aiders, Lab In-Charge, Hypo plant/ HCl plant Chargemen and Civil Personnel are designated as essential employees during shift timings. These people will report to their department heads at the site of emergency and carry out their instructions to bring the emergency under control under the overall direction of Incident Controller.

Any other Person(s) requisitioned by Site/Incident Controller(s) from time to time will be treated as essential employees. Since the Shift Engineer 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 Site Controller/Incident controller of respective divisions and other key personnel at the scene of emergency. Apart from the above personnel following specific persons are drawn up to tackle emergencies in individual units.

EMERGENCY PROCEDURES

Any person who notices first an emergency situation within the factory will contact the Shift Engineer of respective division / Main Control Room Supervisor of that shift and intimate him about the emergency. Emergency reporting is also done by the personnel mentioned under 4.9.

Particulars to be Furnished

The informer and receiver must identify each other first. The informer then gives the detail about the exact incident and location and along with any other relevant information he can give about the incident. Since it is an emergency communication every one has to be brief and precise.

Declaration of Emergency

The Shift Engineer on receipt of the information will initiate suitable action to contain and control of the emergency situation. He will arrange to inform the key personnel about the incident depending upon the severity of the incident, he will initiate action for declaration of emergency through P.A. system.

Assembly Points

The front side of the Administrative building and D.G.sets Furnace oil storage area are designated as Assembly Points. The accommodation capacity in each Assembly point is approximately 300.

North-east gate (Weigh bridge area) and North-West gate (Shivteck main gate area) are designated as assembly points at chloromethanes plant. The accommodation capacity in each Assembly point is approximately 200.

Emergency Control Centre

A room in the Administrative Building has been designated as Emergency Control Centre.

Procedures for Evacuation

On declaration of emergency 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 as will be announced thro' P.A.system. The evacuation activity in individual sections will be organised by concerned section supervisor. Arrow markings in fluorescent paint has been made indicating the route to be taken to reach Assembly Point. All employees are made familiar with the routes so they can take the route without panic during emergency.

Evacuation

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

(Transport Arrangement and Shelters are included in **Annexure-27&28**)

Rescue

Four members trained in first aid will form the rescue team.

The rescue team will report to the incident controller and according to the instructions the team will rescue persons under the guidance of Safety Officer who are either injured or trapped and transport them to the first aid centre/place of safety. The rescue team members will wear necessary personnel protective equipments. The rescue team comprises Safety Chargeman, First-aid Attendent, duty security guard cum driver and the fire guard.

Head Count

At the Assembly Point the head count will be taken by the shift Security Supervisor and P&A 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. The rescue team will go and search for the missing if any.

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 by Shift Security and on duty Time keeper. If necessary additional assistance from First-aid trained personnel in the plant can be made use off.

Communication of Emergency

The siren is used to intimate everyone about the existence of an emergency in the plant. Siren will be activated by only the designated persons - Shift Supervisor or Shift Engineer.

The siren can be activated based on the area of emergency since switches are provided in different critical locations.

The siren will be sounded in three blasts of "half minute" duration with an interval of 15 seconds in between the blasts.

In case of power outage emergency power is available apart from hand siren which is available will be operated. The location of hand siren is at Castor oil plant and other at Chlorine compressor house.

The Shift Engineer of respective divisions on receipt of the intimation will instruct the Chloro alkali control room supervisor he interim will inform the telephone operator who is present thro' out 24 hours to get in touch with the key personnel and inform them

about the emergency. Further he will arrange announcement thro' Public Address system to all plant personnel about the emergency.

He will ask the control room supervisor to make announcement thro' P.A. System about the nature, and location of emergency and direct the persons to reach the Assembly Point thro' Safe Escape Route based on wind directions.

Intercom is available for internal communication with better back-up.

If power has failed and telephones become inoperative walkie-talkie will be used. Cell phones are available with key personnel.

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 respective shift incharges will discharge these duties from his post/scene of emergency. In case of any emergency in O&F div., the Shift Incharge of C.S.Div./ Shift incharge of CMS plant will discharge the duties of site controller till his arrival.

Location of Push Buttons for Activating the Siren

The switches for activating the siren are located at the following places:

- a) Chlorine storage area.
- b) Chlorine compressor area.
- c) Chlorine filling area.
- d) Main control room.
- e) Thermal chlorination (CMS)

Safety Equipments Available Section Wise

Chlorine Filling

1. Trolley mounted compressed air cylinder and breathing face mask connected with about 30 meters of air hose.
2. Four numbers of air line breathing mask with hose and filter.
3. A FRP hood with adequate length of flexible hose connected to exhaust blower which can be used during leakage.

4. 2 Chlorine Cylinder Emergency Kits to arrest leaks from ton containers.
5. Self Contained Breathing Apparatus of 30 minutes duration – 3 Nos.
6. An axial fan to be used to divert the leakage and make approach easy for repair.
7. 4 Nos of Chlorine sensor with alarm which will alert leakages in its early stage.
8. Push button to activate emergency siren.
9. Emergency scrubber start-up push button.
10. Emergency scrubber funnels with hose to suck leaked chlorine.
11. ELBA (Emergency Life Breathing Apparatus) – 6 Nos.

Chlorine Storage

1. Two number of compressed air line gas masks with regulators, filters and hoses.
2. 8 Numbers of funnels fitted with flexible hose to suck the leak and transfer it to the header leading to absorbing system.
3. The storage is completely enclosed with brick walls on all sides and exhaust header is laid and connected to an absorbing system comprising of caustic circulation pumps, caustic holdup vessel and a vent header.
4. Push button system to activate emergency siren.
5. Each tank is provided with 2 numbers of safety valves and rupture discs.
6. Four numbers of chlorine sensors are provided with auto start facility of
7. Emergency Scrubbing system in case of Chlorine exceeds 5ppm
8. Load cells for each tank with level alarms are provided.
9. Fifth Chlorine sensor is installed in ground floor hooked up with
10. Emergency caustic scrubbing system for auto start in case of chlorine
11. Exceeds 5ppm.

Chlorine Compressor

1. One number of trolley mounted cylinder connected with face mask and
2. hose.
3. 4 Numbers of air line breathing masks with flexible air tubing.
4. Emergency shower and eye-wash fountain.
5. One number self contained breathing set of 30 minutes duration.
6. One number air line mask with hose is available in chlorine liquefier.
7. Emergency Life Breathing Apparatus of 15 minutes duration 2 Nos.

Control Room

1. Compressed air breathing apparatus - 1 number.
2. One number of chemical suit.

3. One set of nose fitted mask.
4. Safety belts.
5. Electrically tested gloves (11KV).
6. Boric acid - 5% solution in 1/2 lit. bottle.
7. Emergency Life Breathing Apparatus of 15 minutes duration 3 Nos.

Cell House

1. Three numbers of air line breathing mask with flexible hose, regulators and filters.
2. One number of self contained breathing apparatus.
3. 5% Boric acid solution in 1/2 lit. Bottles.
4. Emergency shower and eye-wash fountain.

Dechlorination Plant

1. Four numbers of air line breathing connected to masks with flexible hose, regulators and filters.
2. 5% Boric acid solution in 1/2 lit. Bottles.
3. Emergency shower and eye-wash fountain. – 3 Nos.
4. Chlorine sensor at the top of D-603 (suction seal) vent top.

Hydrochloric Acid Plant

1. Two numbers of air line breathing masks with flexible hose, regulators and filters.
2. Emergency shower and eye-wash fountain.

Brine Plant

1. Emergency shower and eye-wash fountain.

Caustic Evaporation Plant

1. 5% Boric acid solution in 1/2 lit. Bottles.
2. Emergency shower and eye-wash fountain.
3. Face shield.

Chlorine Drying

1. Three numbers of air line breathing masks with flexible hose, regulators and filters.

Hypo Section

Two numbers of air line breathing masks with flexible hose, regulators and filters.

Chloromethanes Plant

1. Face shields and helmets.
2. Emergency shower and eye-wash fountain - 5 numbers.
3. Safety goggles.

Location of Chlorine Sensors

1. The four chlorine storage tanks are equipped with chlorine digital sensors individually & autos start the emergency scrubber at 5PPm. (With audiovisual indicators parallel to the control room) and Fifth chlorine sensor is installed in ground floor hooked up with emergency scrubber system for auto start at 5PPM.
2. In chlorine bottling section digital audiovisual alarm – 4 Nos.
3. In Hypo plant chlorine sensor with digital indicators and with recording system.
4. Behind HCl plant chlorine sensor with digital indicator and recording system.
5. Two no's of chlorine sensors are installed at HCL plant blower & road side area.
6. Chlorine sensor near Security gate – West side.
7. Chlorine sensor at De-chlorination plant suction seal vent.
8. At Co-generation plant chlorine cylinder handling area(Old & new water clarifier) and Main Gat –1 Nos.
9. In Cell house chlorine sensor with digital audiovisual alarm- 5 nos

List of Fire Extinguishers, Sand Buckets & Hand Appliance

S. No	Location	Fire bucket		Foam		DCP (Kg)		CO2 (Kg)			
		Sand	Water	Chem	Mech	10	5	22.5	6.8	4.5	2
1.	Thermax Boiler	2	-	-	-	1	-	-	1	1	-
2.	New Thermopac MCC	2	-	-	-	-	-	-	1	-	-
3.	New thermopac	-	-	-	-	-	1	-	-	-	-
4.	Oil Storage tank area	0	-	-	-	-	1	-	-	-	-
5.	Instrument department	0	-	-	-	-	1	-	-	1	-
6.	Store yard	2	-	-	-	-	-	-	1	1	-
7.	Store room	-	-	-	-	-	1	-	1	-	-
8.	MCC-2	2	-	-	-	-	-	-	1	-	-
9.	PLC Room	-	-	-	-	-	-	-	-	1	-
10.	DG Heat Pump-MCC	-	-	-	-	-	-	-	-	1	-
11.	WHR Boilers-MCC	2	-	-	-	-	-	-	1	-	-
12.	DG Engine Room	6	-	2	-	2	-	2	-	-	-
13.	Control Room(DG)	-	-	-	-	-	-	-	-	1	-
14.	PMCC1 & Control Room(DG)	-	-	-	-	-	-	-	-	1	-
15.	NGR & Battery room(DG)	-	-	-	-	-	-	-	-	1	-
16.	PMCC2 & HT Room(DG)	-	-	-	-	-	-	-	-	1	-

17.	HFO Separator room	-	-	-	-	1	-	-	-	-	-
18	Fuel transformer pump House	2	-	-	-	-	-	-	-	1	-
19	FO & HSD Storage tanks	2	-	2	4	-	-	-	-	-	-
20	K ₂ CO ₃ Plant	2	-	-	-	-	2	-	1	-	-
21	Emergency DG	2	-	-	-	-	-	-	-	1	-
22	MCC-1	2	-	-	-	-	-	-	-	2	-
23	PMCC Room & Bottom	2	-	-	-	-	-	-	-	2	-
24	Elect. 11KV Room	2	-	-	-	-	-	-	4	-	-
25	Elect. Switch Yard	4	-	-	-	-	-	-	3	-	-
26	Rectifier room	6	-	-	-	-	-	5	1	--	-
27	Control room & New DCS room	-	-	-	-	-	-	-	3	-	-
28	Old De-chlorination		--	-	-	-	-	-	-	-	-
29	Cell House -(1 to 6)	-	-	-	-	-	10	-	1	7	2
30	Cell Houses Bottom	2	-	-	-	-	5	-	-	-	-
31	3 rd Cell house H ₂ holder area	-	-	-	-	-	-	-	-	-	-
32	Cl ₂ Compressor plant & MCC	4	-	-	-	-	-	-	4+1	-	-
33	Cl ₂ Storage plant	2	-	-	-	-	2	-	-	-	-
34	Cl ₂ filling plant	2	-	-	-	1	-	-	-	1	-
35	Sodium Hypo Plant & MCC	4	-	-	-	-	1	-	-	1	-
36	HCL 1,2 & 3	8	-	-	-	1	6	-	-	5	-
37	Evaporation plant	-	-	-	-	-	-	-	-	2	-
38	New De-chlorination & MCC	-	-	-	-	-	-	-	-	2	-
39	New De-Chlorination plant	4	-	-	-	-	5	-	-	1	-
40	Telephone section	-	-	-	-	-	-	-	-	1	-
41	Marketing department	-	-	-	-	-	1	-	1	-	-
42	Canteen	-	-	-	-	-	-	-	-	1	-
43	Castor Oil plant	4+4	-	9	6	2	6	-	6	2	-
44	Thermopac unit	2	-	-	-	-	1	-	-	1	-
45	Fatty acid plant	2	-	-	-	-	5	-	1	6	-
46	Soap plant & Godown grd floor , 1 st floor	-	-	-	-	1	-	-	2	2	-
47	Soap noodles plant	-	-	-	-	-	-	-	-	-	-
48	Caustic fusion plant	-	-	-	-	-	2	-	-	-	-
49	Caustic fusion & MCC	-	-	-	-	-	-	-	-	2	-
50	Barium sulphate plant	-	-	-	-	-	-	-	-	1	-
51	KOH plant	-	-	-	-	-	-	-	1	-	-
52	Fire pump house	2	--	-	-	1	-	-	-	-	-
53	Sr. Executives offices	-	-	-	-	-	-	-	1	-	-
54	Air compressors & MCC Room	-	--	-	-	-	-	-	1	-	-
55	Pump house (near river)	-	-	-	-	1	-	-	-	1	-
56	Hydrogen bottling plant	-	-	-	-	-	-	-	-	-	-
57	Central lab	8	-	-	-	-	-	-	2	-	-

58	Glycerine plant	-	-	-	-	-	-	-	-	2	-
59	Conference hall	-	-	-	-	-	-	-	1	-	-
60	E.D.Tech(office)	-	-	-	-	-	-	-	-	1	-
61	Mechanical office	--	-	-	-	-	-	-	1	-	-
62	Galaxy plant	-	-	-	-	-	2	-	-	-	-
63	Brine plant MCC Room	-	-	-	-	-	-	-	-	2	-
64	New fusion plant	-	-	-	-	-	-	-	2	3	-
65	6 th cell house de-chlorination 1 st floor	-	-	-	-	-	-	-	-	1	-
66	4 th Evaporation plant	-	-	-	-	-	-	-	1	-	-
67	Resin stocks (Brine Plant)	-	-	-	-	-	-	-	-	1	-
68	Paints godown	-	-	-	1	-	-	-	-	-	-
69	CMS plant	20	-	-	5		4		4	4	-

Detail of Fire Fighting System

- Fire Hydrants - S.H -78 + F.ES - 26
- Delivery Canvas Hose pipes - 63 x 15 mts.-85Nos. + 63 x 7.5 mts.20 Nos.
- Branch pipes 5/8" - 26 Nos. + Fog Nozzle – 3 Nos.
- Foam Making Branch Pipes - 3 Nos. + Foam Makers -05 (Tank)
- Foam Compound - 1500 Lts.
- Dividing Beaching - 1 No.
- Fire water pump - Cap. 273 m³/h. Pres. 7.5 kg/cm² Driven HP- 120 HP
- Fire water pump - Cap. 273 m³/h. Pres. 7.5 kg/cm² Diesel Driven HP- 120 HP
- Jockey pump - Cap 10.8 m³/h. Pres. 7.5 kg/cm² Driven HP 20 HP-2 Nos.

The jockey pump will maintain the header pressure and on drop in pressure the pressure switch will activate main pump and supply header pressure will be maintained at 7 kg/cm².

- 6. Static fire water storage tank - Cap. 700 + 600 m³/h.
- 7. Foam pourers on fuel oil tank - 05 Nos.

Chloromethanes Plant

- 1. Water + Foam monitors - 7 Nos
- 2. Water monitors - 5 Nos
- 3. Down comers - 25 Nos
- 4. Yard hydrants - 15 nos

Name and Address of persons giving information:

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8.0 PROJECT BENEFITS

8.1 Introduction

M/s. SRAAC obtained Environment Clearance Vide file no. F. No. J-11011/619/2009-IA.II (I), dt. 14.02.2012. It is proposed to expand the manufacturing capacity of Chlor-Alkali, Chloro methanes, Oil and fatty acid division and inclusion of Chlorodifluoromethane plant in an existing area of 152.40 ha at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The capital cost for expansion is Rs. 360 crores contributing to the local economy due to consumption of building construction materials from the surrounding areas and usage of construction labour from surrounding villages.

8.2 Employment Potential

There is a potential for direct/indirect employment of about 300-400 people during construction phase and 350 during operation phase due to the proposed expansion. It will be spending approximately 90 lakhs of rupees every month on salaries providing bread and succor to 350 families additionally. The proposed project will also generate indirect employment to the locals during construction phase. The employers will contribute to the provident fund, ESI and provide facilities as per the relevant labor act.

8.3 Corporate Social Responsibility

The management proposes to spend 2.5% of the capital cost of expansion of 2% of profits during operation towards social development activities in the surrounding villages. The objective is to obtain a social licence from the stake holders who are likely to be affected due to the expansion and the proposed manufacturing activities.

Tax Income

The proposed capital expenditure of Rs. 360 crores includes GST on various equipment and services to the tune of Rs. 45 crores. The provision of employment also directly contributes to additional income tax and also indirectly contributes to additional GST

due to various transactions. The operation of the expansion project also results in additional GST and also additional income tax on profits.

9.0 ENVIRONMENT COST BENEFIT ANALYSIS

The TOR letter F.No. J-11011/84/2016-IA II (I) dated 21.06.2016, does not mention Environment Cost Benefit Analysis and hence the same was not conducted.

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

2. ENVIRONMENT MANAGEMENT PLAN

**Project No. 0118-13-03
January 2018**

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**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**

10.0 ENVIRONMENT MANAGEMENT PLAN

10.0 Introduction

Environmental protection is an issue that no organization can neglect and hope to survive. The by-products of civilization are being dumped upon the environment to a degree that the environment finds difficult to assimilate. The key to the success of the integrated approach to pollution prevention and control is the management and operation of the organization. Effective committed management delivers a successful industry. As total commitment to the environment, not just for compliance with legal or regulatory compliance will be the essence of environment management of an industry. Many companies have recognized the benefits of implementing an effective environmental management system.

Environmental management plan can be effectively implemented to mitigate the pollution levels by observing the following;

1. Pollution will be prevented or reduced at the source,
2. Pollution that cannot be prevented will be recycled in an environmentally safe manner,
3. Pollution that cannot be prevented or recycled will be treated in environmentally safe manner, and
4. Disposal and other releases into the environment will be used “only as a last resort” and will be conducted in an environmentally safe manner.

The management plan is drawn in consultation with the project proponents with reference to various potential impacts monitored, identified and predicted in the previous chapters. The measures to be taken for mitigation and control of the impacts are presented. The measures proposed as part of expansion project to address the impacts identified in environmental impact assessment report of the same are presented in appendix of the environmental impact assessment report. Review of the process is the essential component of environmental management. M/s. Sree Rayalaseema Alkalies and Allied Chemicals

Limited had been conducting experiments to optimize the consumption of raw materials and to increase the purity of the product.

10.1 Environment Management Plan *(Terms of Reference No. 10)*

10.1.1 Construction Phase

The proposal is for expansion and does not involve major civil construction, potential of pollution during construction phase due to transport of construction materials will be less compared to operational stage. However industry will ensure that pollution potential in the construction phase is at a minimum. Wherever applicable, detailed procedures will be developed for control of pollution during project execution phase for expansion. Separate rooms will be provided for labors and casual workers. The following measures are to be adopted to minimize pollution load during construction phase.

Sanitation

Considering the standards of hygiene, the workers involved in construction will be provided temporary toilets, and drinking water. The toilets will be attached to septic tank so as to minimize the percolation and to control the subsequent impact on the environment. These facilities will be properly designed and maintained to ensure minimum environmental impact.

Noise

The site is located in a place where habitation is minimum and at distance of 1.2 Km. Thus there will be insignificant impact due to noise on the inhabitants. The construction workers on site will be provided with personal protective equipment like earmuffs whenever for those who work near noise generating equipment/sources.

Wastes from Construction Equipment

Construction activity involves a number of operations that utilize equipment like DG sets, dozers, cranes etc. These equipment are a source of emissions and solid wastes. Proactive maintenance to mitigate emissions, while the hazardous solid wastes of waste oils and used batteries are sent to authorized recyclers. Spillage is avoided and spill control measures are

adopted to minimize contamination of soil and ground water resources. The empty containers of paints, thinners etc shall be sold to authorized buyers.

10.1.2 Operation Phase

During operation stage the major pollution from the proposed expansion is from liquid effluents from process, utilities and domestic usage, and air pollution from process, utilities and or combustion of fuels/wastes. The effluent treatment system will convert most of the liquid effluents to solids by way of evaporation of salts and ETP sludge. The environment management plan is drawn in consultation with the project authorities, R&D experts of Sree Rayalaseema Alkalies and Allied Chemicals Limited and other technical consultants involved in preparing the project plan. The management, mitigation and enhancement measures identified for significant impact sources are presented as follows;

10.2 Sources of Pollution from Manufacturing Process:

The major contributions of pollution from proposed expansion are effluent generation from process, utilities and domestic sources and gaseous emission from process and utilities. The water pollution is due to the effluent generated from process, washings, utility blow downs and domestic sources. The air pollution is caused due to process operation and combustion of both fuels and solid/gaseous wastes. The quantities and quality of effluents, emissions and solid wastes are identified and quantified in the environmental impact assessment study. The environment management measures proposed are described as follows;

10.2.1 Water Pollution (*Terms of Reference No. 3(vi) & 7(iv)*)

The main sources of effluent generation from the plant are from process, floor washings, blow downs from boiler and cooling tower and domestic effluents. Effluents from process, washings, utility blow downs and domestic wastewater of Chlor-Alkali, Oil and fatty acid division and co-generation power plant will be sent to the effluent treatment system and treated effluent reused for greenbelt development and process. Effluent from chloromethanes and proposed chlorodifluoromethanes are sent to effluent treatment followed by RO. RO permeate reused for process and rejects recycled for brine saturation of

Chlor-alkali plant. The total effluent generated and mode of treatment is presented in **Table 10.1**.

Table 10.1 Total Effluents Generated and Mode of Treatment *(Terms of Reference No. 7(iv))*

S.No	Description	Quantity (KLD)		Mode of Treatment/Disposal
		Existing	Proposed	
I	Chlor-Alkali (Or) Potassium Hydroxide			
1	Process	97.5	94	Sent to effluent treatment plant and treated effluent reused for greenbelt development.
2	Washings			
3	Gland Seal			
4	Cooling towers blow down	82.5	62.5	
5	Domestic	85	8	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - I	265	165	
II	Chlormethanes and Chlorodifluoromethanes			
1	Cooling towers blow down	57	57	Sent to effluent treatment plant of Chlor-alkali followed by Ultra filtration and RO. Permeate reused for process and rejects sent for brine saturation.
2	Scrubbers	20	20	Sent to Brine make-up in chlor-alkali plant
3	Domestic	10	5	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - II	87	82	
III	Co-Generation Power Plant			
1	Floor Washings	30	---	Sent to effluent treatment plant and treated effluent reused for greenbelt development.
2	Cooling towers blow down	600		
3	Domestic	50		
4	DM Plant /RO Rejects	405	---	330 KLD is reused for Brine make-up in chlor-alkali plant and 75 KLD reused for green belt development.
	Total -III	1085	---	
IV	Non EC Products	50	---	
Grand Total (I+II+III+IV)		1507	247	

10.2.1.1 Process Description and Technical Specification of Effluent Treatment System

The effluents generated are collected in equalization tank to have uniform flow rate and effluent characteristics to subsequent treatment operations. The effluent from equalization tank is neutralized by using acid/alkali and pumped to presetting tank. After primary settling for 2.5 hours the effluents are passed to flocculent mixer where the flocculent are added. After mixing the effluent, it is settled in secondary clarifier for nine hours where the flock will be settled in the tank. The clarified effluent will be passed to treated effluent storage tank. The settled sludge in pre-settler and secondary clarifier will be pumped to sludge drying beds. The Characteristics Before and After Treatment of Effluent treatment plant are presented in [Table 10.2](#). Details of treatment facilities are presented in [Table 10.3](#). and schematic diagram of ETP is presented in [Fig 10.1](#). The treated effluent will be reused for green belt development within plant premises. The domestic effluents are treated in septic tank followed by soak pits.

Table 10.2 Effluent Characteristics before and after Treatment

Parameter	Effluent Characteristics	
	Before Treatment	After Treatment
PH	6-9.0	6-9.0
Suspended solids	150	<100
Total dissolved solids	2400	<2000
Chlorides	1000	<500
Sulphates	140	140
Biological Oxygen demand	25	15
Chemical Oxygen demand	200	100
Oil and Grease	<10	5

Note: All values except pH are mentioned in mg/l.

Table 10.3 Details of Treatment Facilities

S.No	Facility Description	Capacity of Unit (KLD)			
		Installed Capacity	Proposed	Total after Expansion	Operating Volume after Expansion
1	Effluent Treatment Plant	1850	300	550	486
2	Sand filter		--	600	486
3	Ultra Filtration Plant		--	600	486
4	Reverse Osmosis Plant		150	550	480

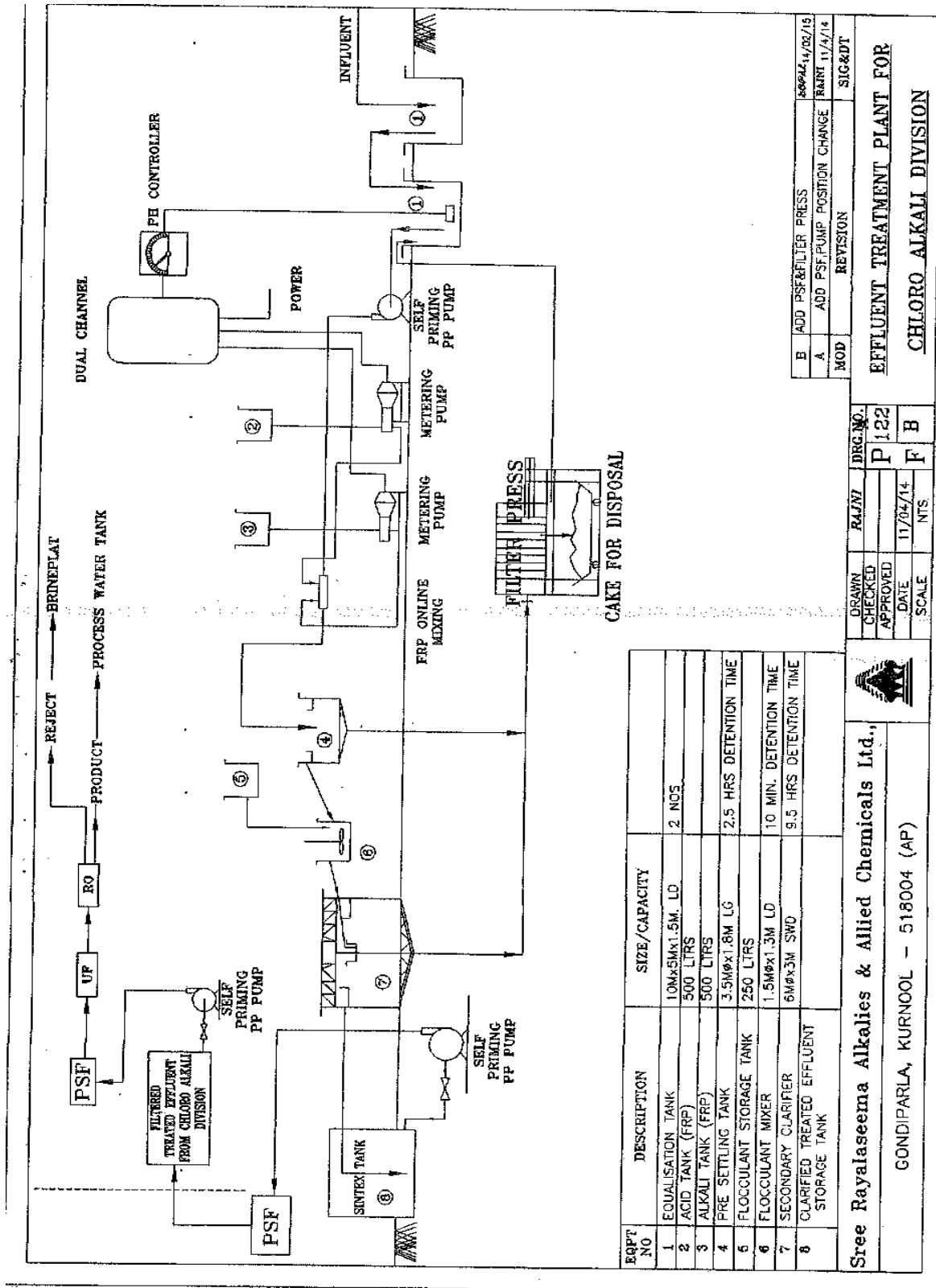


Fig 10.1 Schematic Diagram of Effluent Treatment Plant (Terms of Reference No. A.4)



Existing Effluent Treatment Plant Photographs

10.2.2 Air Pollution (Terms of Reference No. 3(vi))**10.2.2.1 Emissions from Utilities (Terms of Reference No. 7(v))**

No additional boiler proposed for the plant except 1 x 500 KVA standby DG Set. The sources of air pollution from the plant are from 1 x 45 TPH, 1 x 100 TPH, 1 x 110 TPH coal fired Boilers, DG sets and Incinerator in chloromethane plant. The existing air pollution control equipment for coal fired boilers is Electro static precipitators (ESP). DG sets shall be provided with stack heights based on the CPCB formula for effective stack height. The emission details for the waste heat recovery boilers, Coal fired boilers and DG sets are presented in **Table 10.4**. Other emission sources are presented in **Table 10.5**. Technical specifications of ESP are presented in **Table 10.6**.

Table 10.4 Details of Stacks and Emissions from the Plant

S. No	Stack attached to	Height (m)	Emission rates of Pollutants (g/sec)		
			PM	SO ₂	NO _x
1	WHR Boilers – 1 and 2	46	0.7	27.7	56.2
2	WHR Boiler-3	46	0.35	13.9	28.1
3	WHR Boiler-4	46	0.35	13.9	28.1
4	WHR Boiler-5	46	0.35	3.89	28.1
5	Hydrogen/Furnace oil fired boiler	20	Traces	Traces	Traces
6	Husk fired boiler	30	0.45	0.23	0.8
7	Salt Furnace	30	0.03	2.7	0.53

* All the units except salt furnace are kept as standby.

Table 10.5 Emission Details of Other Utilities

S.No	Stack Attached to	Stack Height (m)	Diameter of stack at top (m)	Temp. of exhaust gases (°C)	Exit Velocity (m/sec)	Pollutant Emission Rate (g/sec)			
						PM	SO ₂	NO _x	HCl
Proposed									
1	500 KVA DG Set*	5	0.25	185	7.2	0.004	0.028	0.16	-
Existing									
1	45 TPH Coal fired Boiler	55	1.37	140	10	0.95	1.44	1.56	-
2	100TPH Coal fired Boiler	69	2.5	185	11.2	3.54	5.8	6.1	-
3	110 TPH Coal fired Boiler	80	2.9	185	16	5.39	9.14	11.78	-
4	160 KVA DG Set*	3	0.12	160	20	0.002	0.022	0.12	
5	285 KVA DG Set*	3	0.12	160	6.5	0.002	0.022	0.14	
6	400 KVA DG Set*	4	0.15	165	6.5	0.003	0.024	0.15	
7	500 KVA DG Set*	4	0.25	185	7.2	0.004	0.028	0.16	
8	383kg/hr Incinerator*	12	0.6	45	7.0	-	-	2.43	0.1

*DG sets shall be kept as standby.

Table 10.6 Technical Specifications of ESP

S.No	Design Parameters	Units	Design Value		
			45	100	110
1	Gas Flow rate	Cu.m/sec	23.36	57.80	69
2	Temperature (flue gas)	° C	140	150	140
3	Dust concentration (inlet)	gm/Nm ³	56	62	112
4	Dust concentration (outlet)	mg/Nm ³	115	100	< 50
5	Number of precipitator per Boiler	No.	1	1	1
6	Number of gas path per Boiler	No.	1	1	1
7	Number of field in series	No.	3	3	5
8	Collection efficiency	%	99.84	99.84	99.9
9	Pressure drop across the precipitator	mmWC	< 25	<25	< 25
10	Velocity of gas	m/sec	0.78	1.00	0.63
11	Treatment time	Sec	18.46	15.70	41.09
12	Number of gas passage	No.	03	16	27
13	Nominal width of the ESP	m	4.8	6.8	10.8
14	Nominal length of the ESP	m	14.5	25	26.25
15	No. of collecting electrode per field	No.	180	119	196
16	Specific collecting area	M ² /M ³ /Sec	92	78.48	205.43
17	Total collecting area	M ²	4896	4536	14175
18	No. of emitting electrode in each field	No.		672	1134
19	No. of collecting electrode for ESP	No.		357	980
20	No. of emitting electrode for ESP	No.		2016	5670
21	Type of hopper and No. of hopper	No.	03	03	10 Nos.

**Fig 10.2 Photographs of Bag Filter of Dust extraction system**



Fig 10.3 Photographs of Electro Static Precipitators

10.2.2.2 Emissions from Process (*Terms of Reference No. 7 (vi) and A.2*)

I. Chlor-Alkali Plant

In chloro-alkali plant the gaseous emissions are chlorine and hydrogen chloride vapours. Due to advancement of control checks and due to membrane cell electrolysis, possibility of chlorine emission to atmosphere is negligible. Scrubbing systems are provided to neutralize sniff gases effectively. Even the dilute chlorine is also being converted to sodium hypochlorite after neutralisation with caustic soda at control temperature leading to value addition.

(a) Chlorine Emissions

The sources of chlorine emissions are cell house, Dechlorination unit, chlorine liquefaction and chlorine storage and filling.

Cell House

Cell house is equipped with safety inter locks, safety blow out seals, etc. Either during power failure or due to any miss operation chlorine is diverted to neutralisation unit automatically. Cell house emissions will not change after the expansion as the emissions in this section are due to failure of systems only.

Dechlorination Section

Brine after electrolysis which is called depleted brine contains about 0.3 g/l of dissolved chlorine. Since we have installed Vacuum Dechlorination system, it is suck the dissolved gas

in enriched form to main chlorine header instead of blowing it to neutralisation unit. This will help to effectively liquefy all the chlorine instead of sending it neutralisation unit. This will facilitate reduction in chlorine diversion to neutralisation. Hence after expansion there will not be any emission from this operation but there will be some additional economic benefits.

Chlorine Liquefaction Section

Chlorine is generated during electrolysis as a co-product. 70% of chlorine is being liquefied and sold as liquid chlorine. After cooling, the chlorine is blown to drying unit to eliminate moisture, compressed in compressors and diverted to liquefier wherein it gets liquefied. During liquefaction, depending upon gas purity, 95% of chlorine gets liquefied and the balance quantity comes out as sniff gas and the same will be burnt in hydrochloric acid synthesis unit.

The industry is supplying Hydrogen chloride gas to a down stream unit to manufacture chlorosulphonic acid. All the sniff chlorine from chlorine liquefaction, containing about 10MT of chlorine, is burnt in synthesis unit to make Hydrogen Chloride gas instead of sending it to neutralization. In spite of increase in liquid chlorine production, all the sniff chlorine can be utilized effectively and safely as is being used now in the manufacture of Hydrochloric Acid. So there is no additional load on neutralization.

Chlorine storage filling and handling

For chlorine storage, four tanks of 100 MT capacities are available. One tank is always kept as dump tank, chlorine sensors are installed near each tank with an indication in control room to alert all, in time, in case of any leakage. Load cells are provided for indication of tank weight locally as well as in control room. Excess level alarm, excess flow shut-off valves, gas masks, etc., have been provided in storage area.

In filling section also, chlorine sensors are provided to sense leakage of chlorine. Load cells to allow correct filling of chlorine tonners are provided. Scrubbing system around the

filling section to take care of accidental emissions is in operation. Apart from this, emergency kits, gas masks and trained man power are available round the clock.

To avoid chlorine storage risk totally, the industry has commissioned a scrubbing system exclusively for chlorine storage and filling area, to take care of any accidental emission and to avoid spreading of chlorine to nearby area. Arrangements are also being made to take back left over liquid chlorine, after filling, to liquefaction unit for reprocessing to reduce load on neutralisation unit.

Initially, chlorine neutralization was with milk of lime and the resultant bleach liquor was supplied to nearby paper mill. After its closure, the industry has switched over to scrubbing with caustic. Now the industry has three caustic scrubbing towers in series.

With available facilities and expertise in handling chlorine, chlorine emissions to atmosphere are being maintained between 0.6 to 1 ppm in vents. These levels are well below the prescribed limits. The industry has provided seven chlorine sensors at critical places like chlorine storage and filling, hypo plant. Some sensors have recording facility.

Normally chlorine goes to neutralisation from chlorine filling and brine Dechlorination. In case of either process problems or power failure, release of chlorine to neutralisation unit takes place. Chlorine neutralisation unit is provided with emergency power supply to run in case of power failure and also one blower and one caustic circulation pump are exclusively provided with Diesel engine to run in case of failure of emergency supply also. The resultant Sodium Hypo is a value added product, since it is being used in many oxidation reactions. A dedicated chilled water system is also provided to take care of heat of reaction during neutralisation and to make a quality product. There will be marginal increase in chlorine to neutralisation from filling. But as the total quantity of chlorine will be the same, the industry shall be in a position to maintain total scrubbing keeping the outlet emission well below stipulated specification.

A chlorine sensor is also provided at final neutralisation tower outlet to monitor the chlorine emission to atmosphere after neutralisation. Due to double absorption, chlorine emission from scrubber outlet is below stipulated limits. Since there is no further load on neutralisation unit, emission of chlorine to atmosphere will continue to be well below prescribed limits. With available safety precautions, equipment and skilled manpower, practically there will not be any additional chlorine emissions to atmosphere even after expansion. The quantity of chlorine generated, captive usage and salable product is presented in **Table 10.7**. Chlorine storage tanks and interlock system photographs are presented in **Fig 10.4**.

Table 10.7 Details of Quantity of Chlorine (Terms of Reference No. A.14)

S.No	Description	Quantity (TPD)		
		Existing	Proposed	Total after expansion
1	Total Chlorine Generated	460	440	900
2	Chlorine for captive usage			
	a. Hydrochloric Acid	155	135	290
	b. Sodium Hypochlorite	5	5	10
	c. Liquid Chlorine	300	300	600
	Liquid Chlorine Distribution			
	a. Chloromethane	130	130	260
	b. Sree Rayalaseema Hi-Strength Hypo Ltd.	150	50	200
	c. Domestic Market	20	120	140
3	Total Chlorine Storage Capacity (MT)	4 x 100	--	4 x 100*

Note:

1. However chlorine to HCl and liquid chlorine production will vary according to market demands.

2. To consume additional chlorine produced from proposed expansion, it is proposed to promote entrepreneurs to establish chlorine derivate products like CPW.

* 1 x 100 MT kept empty to transfer the material from other tank in case of emergency. The excess chlorine will be sold as product.



Fig 10.4 Chlorine storage tanks and Interlock system

II. Chloromethanes Plant

(a) HCl Absorption

Majority of the HCl gas produced from thermal chlorination unit is used to produce methyl chloride. Excess HCl available is absorbed in HCl absorber to produce 32% HCl. To avoid emissions from HCl absorber, tail gas vents are connected to a tail gas tower followed by organic stripper to remove organics. To avoid emissions in the plant, tail gas vents are connected to a venturi scrubber and the lean acid formed is used for absorption of Hydrogen chloride gas in absorber. With this modification, the possibility of HCl gas emission to atmosphere is totally curtailed. Apart from this, all vents of hydrochloric acid storage tanks and receivers also have been connected to water ejector to avoid emissions. The HCl gas emissions from all the vents are less than 10 mg/Nm^3 which is within the

prescribed limit. The flow diagram of scrubber is presented in **Fig 10.5**. Technical specifications of Scrubber is presented in **Table 10.8**.

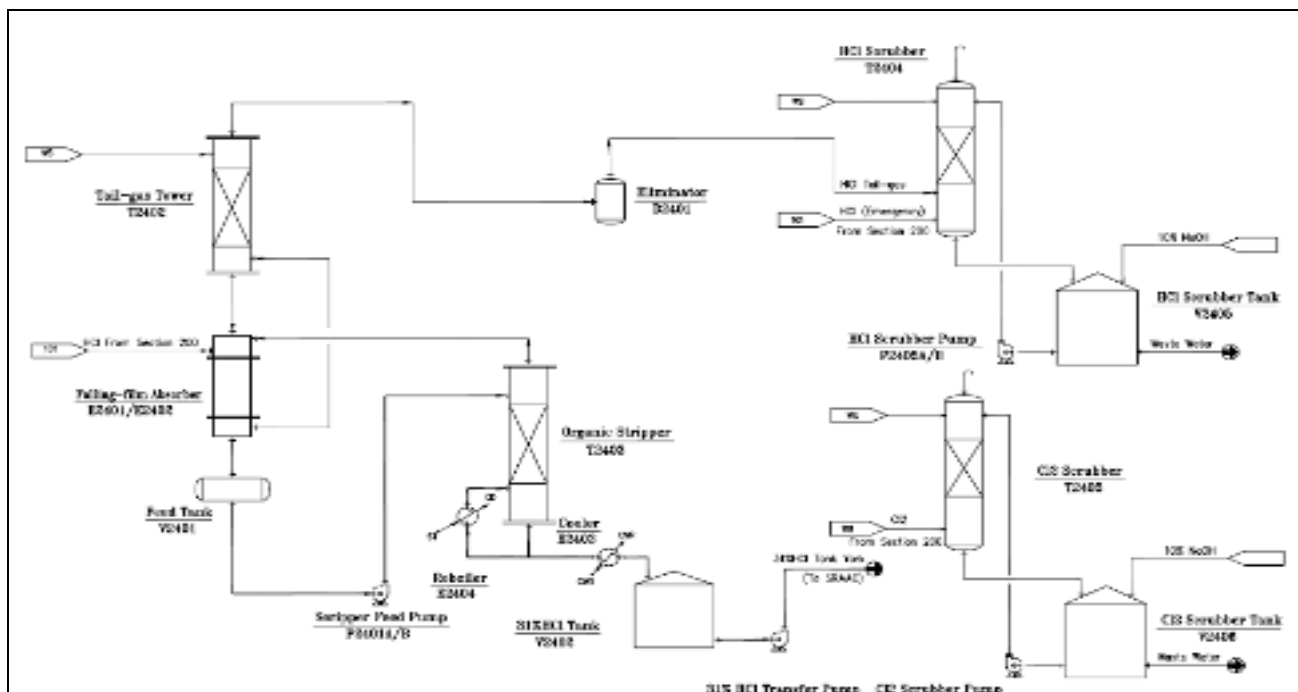
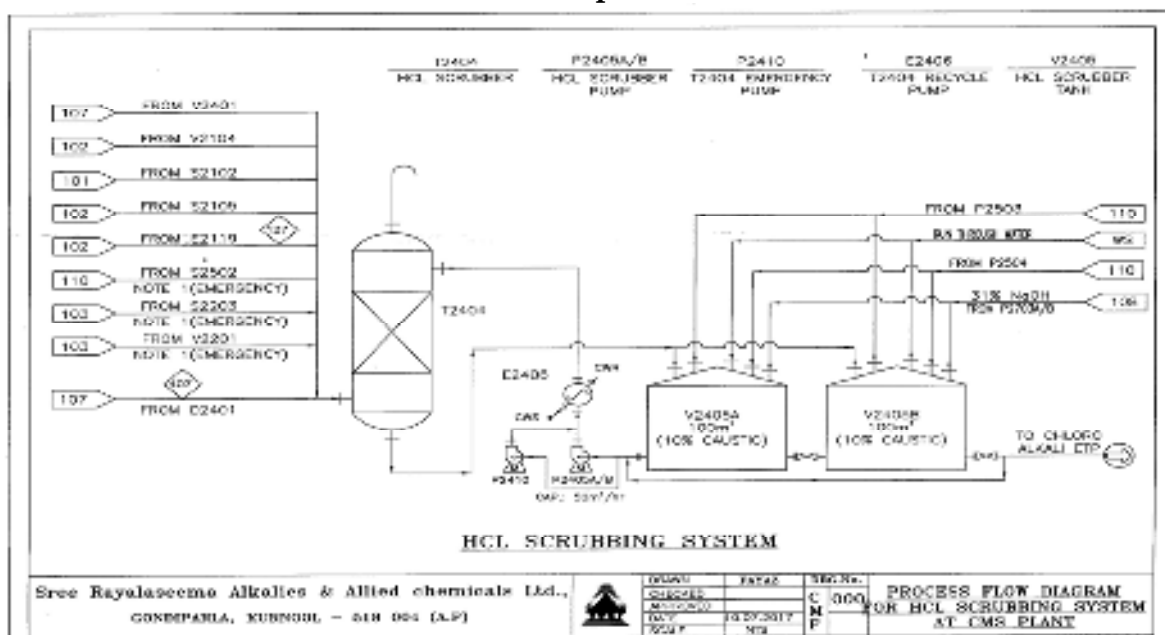


Fig 10.5 Process flow diagram for Scrubber



Scrubbing System for HCl generated from Chloromethane

Table 10.8 Technical Specifications of Scrubber



10.2.3 Incineration of Carbon Tetra Chloride and Waste Streams

The liquid waste streams generated from chloromethanes manufacture are mixed and stored in a day tank and pumped using a metering pump to fuel oil cum liquid waste burner located on the incinerator. The waste liquid consists of mostly all chlorinated compounds.

Incineration System

The furnace is followed by absorption system, scrubbing system and stack.

Liquid Incineration Chamber

This is vertical, cylindrical down fired furnace lined with refractory and insulating material. The common liquid waste is incinerate through a forced draft, steam atomized multi fuel burner. The produces short, high intensity flame and ensures efficient mixing with air and oxidation of the organic compounds in the waste liquid. Fuel oil, diesel is fired to the same burner during initial heat up and as required to maintain high temperature of incinerator. Organics in the waste are completely decomposed and oxidized to form CO₂, H₂O and HCl with minimum free Cl₂ under strong oxidation atmosphere, high temperature and

turbulence. Extra steam is added directly in the incinerator to ensure that the equilibrium is maintained in favor of HCl formation, which is important to maximize the recovery of HCl from flue gas and minimize free Cl_2 , which also needs to be removed before discharge. The high temperature of 1400°C also ensures oxidation of hydrocarbons, which is important to avoid formation of toxic compounds when flue gas cools down. Conditions in the incinerator are controlled closely to ensure constant efficiency of incineration.

Absorption Section (HCl Stripper)

Flue gas from incinerator at 1400°C enters absorption section where the HCl in the flue gas is absorbed in a falling film type co current absorber using HCl solution. Main quench cooler is in shell and tube construction with falling film HCl absorber with cooling tower on service side. Tube and tube sheet is in impressive graphite construction. Cooling water is circulated in shell side while flue gas flows through tubes. In the top portion, HCl solution from tail gas / packed tower is introduced in the tubes through liquid distributor where the HCl from the flue gases is absorbed by the liquid flowing through the tubes. The liquid forms a thin film on the tubes. The absorption being exothermic process, heat is removed by circulating cooling tower from shell side. The last section is packed bed saturator, which provides enough residence time to reach saturation temperature. The liquid gets concentrated to 18-20% HCl from the flue gases. At the bottom of the absorber integral recirculation tank along with recirculation pump is provided where part of 18-20 % HCl solution is circulated in tail gas packed bed tower. Recovered HCl 18-20 % solution.

Tail Gas Absorber (Terms of Reference No. A.15)

Tail gas absorber is a packed bed tail gas tower. The unabsorbed gases from quench absorber are passed through this tail gas packed bed tower which has packing's for maximum absorption of HCL. The part residual HCL not absorbed in the above absorber are further absorbed with the help of DM water and HCL solution. Thus weak acid generated due to this is then sent to quench cooler absorber as inlet. The flue gases from tail gas absorber are then sent to a final polishing scrubber.

Scrubbing Section

Remaining HCl and Cl₂ in flue gas is removed by absorption in alkali solution (5% caustic solution) in a scrubber. It is a packed column installed directly on top of tail gas tower but isolated by a chimney tray. Reducing agent in the form of sodium sulfate solution (5% solution) is also added along with alkali solution to decompose NaCl and Na₂SO₄ (at 5% solution) is discharged as bleed from the recirculation tank of the scrubber.

Stack

The clean flue gas is exhausted to the atmosphere through a stack at 30m elevation. The stack is also mounted above packed tower. The entire system operates on a force draft generated by combustion air fan to overcome pressure drop in the system. The combustion air fan also provides continuous cooling air for furnace mountings. Photographs of Incineration system is presented in [Fig 10.6](#) and Technical specifications of incinerator is presented in [Table 10.9](#).



Fig 10.6 Incineration System for CCl₄

Table 10.9 Technical Specifications of Incinerator

S.No	Particulars		System Capacity (Max)
1	Waste liquid CCl ₄ , 99.5% pure Feed Rate		333 Kgs/hr. Max
2	Waste Heavy ends for CCl ₄ rectification		10 kgs/hr. Max
3	Hydrogen Gas consumption (Operation)		5 to 10 kgs/hr. Max
4	LPG Pilot Burner Designed for startup		15 Kgs/hr
5	Cooling water circulation rate at 32°C at min 3.5 kg/cm ² gpr		80 m ³ /hr
6	DM Soft water for HCl absorber		750-1250 kg/hr at 30°C
7	Electrical Power (kw) with stand-by pump		45
8	Installed power (kw) with standby pumps		81
9	Low pressure steam at 3 kg/cm ² gpr		50 kgs/hr. Max
10	Instruments grade compressed air at 4 kg/cm ² g. pressure		6 Nm ³ /hr
11	Emergency water at 3 kg/cm ² g. pressure at 32°C		75 m ³ /hr
12	7% NaOH solution	Nominal when generating 25-30% HCl	25 - 50 kg/hr nominal
13		When too much of impurities in in-coming CCl ₄ complete, HCl generated has to be neutralized and send to ETP	750 Kg/hr. Max
14	5 % Na ₂ SO ₄ solution		5 - 10 kg/hr. Max
15	Make-up water requirement when full HCl to be neutralized		7 kl/hr
16	Bleed water (6.5 - 7% conc), when full HCl to be neutralized		8 kl/hr
17	Space requirement		15 Mtr.L x 15 Mtr. W x 16 Mtr. H

10.2.4 Solid Waste (*Terms of Reference No. 3(vi) & 7 (vii)*)

10.2.4.1 Solid Wastes from Chloromethane Plant

Used silica gel and calcium chloride are the solid waste from the process. These are generated from moisture removal steps of process. The quantities of solid wastes generated are 0.018 TPD of Silica gel and 0.02 TPD of calcium chloride. These wastes are sent to secured land fill.

10.2.4.2 Solid Waste from Chloralkali

Sludge is generated during brine purification stage, and barium sulfate and Magnesium Sulfate is recovered from the sludge and is sold as by product. The sludge generated from the effluent treatment plant will be disposed to landfill which contains mostly inorganics. The quantity of sludge generated depends on composition of salts used. The chemical composition of brine sludge is provided in [Table 10.10](#). The details of various sources and

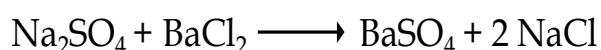
quantities of solid waste generated before and after expansion and disposal methods are presented in **Table 10.11**. The plant is having its own secured land filling site.

Table 10.10 Chemical composition of Brine Sludge

S.No.	Parameter	Percentage (w/w)
1.	Moisture	30
2.	Sand + Clay	40
3.	Calcium carbonate	20
4.	Magnesium hydroxide	9
5.	Barium sulphate	1

10.2.4.3 Barium Sulfate Recovery from Brine Sludge

SRAACL developed in-house technology to recover Barium sulfate from brine sludge by selective precipitation.



During the processing of salt for brine system all the impurities have to be removed down to ppb levels except sulphate level which can be maintained up to 6 gms per litre. Taking this aspect to advantage sulphate is precipitated selectively, by taking part of depleted brine stream from the electrolyzers, with barium salt as barium sulphate. Depleted brine is free from all the impurities and hence there would not be any contamination of the precipitated barium sulphate product.

After precipitating the barium sulphate the brine stream is diverting back to the system for saturation. The sulphate level in the system is being kept constant as the withdrawal from the system is in proportion that adds to the system from salt addition.

The selective precipitation achieves the product in pure form with only sodium chloride contamination. The chlorides are washed in centrifuge and the material is dried, pulverized to the required particle size and then bagged for final dispatch.

Table 10.11 Solid waste generation and mode of disposal

S. No	Description	Units	Consented	Proposed	Total after expansion	Method of Disposal
Chloro-Alkali Plant						
1	Sludge from Pretreatment of brine on dry basis	TPD	16	16	3	Secured landfill within Plant premises
2	Barium Sulphate	TPD	5	5	10	Sold as product
3	Sodium Sulphate	TPD	-	10	10	Sold as product
Potassium Hydroxide						
1	Sludge	TPD	0.71	0.71	1.42	Secured landfill within Plant premises
Chloromethanes Plant						
1	Calcium Chloride	TPD	0.02	0.02	0.04	Secured landfill within Plant premises
2	Silica gel	TPD	0.018	0.018	0.036	
3	Spent Sulfuric acid (75-80%)	TPD		11.9	11.9	Sold as product
Chlorodifluoromethane (R22)						
1	Calcium Fluoride	TPD	-	1.2	1.2	Secured landfill within Plant premises / Sold to hydrogen fluoride manufacturers
2	Spent Sulfuric (75%)	TPD		17.3	17.3	Sold as product
3	Antimony Pentoxide	TPD		0.2	0.2	Recovered and Reused
Utilities						
1	Ash from Coal fired Boilers	TPD	570	---	570	Sold to Cement and brick manufacturers
2	Ash from Husk fired boiler*	TPD	16.5	---	16.5	Sold to Brick manufacturers
3	Sludge from Furnace Oil of DG sets*	KL	0.750	0.15	0.90	Sent to Authorized Recyclers
4	Sludge from Effluent Treatment Plant	TPD	0.140	0.140	0.28	Landfill within Plant site
5	Waste Oils*	TPA	0.15	0.15	0.30	Reused as secondary fuel
6	Used Batteries*	No's/y ear	20	15	35	Sent to Authorized Recyclers

* Generated from Stand by facilities if used

10.2.5 Noise Pollution

Noise is anticipated from Turbine, motors, compressors and DG set. The DG shall be kept in a separate enclosed room with acoustic enclosure. The motors and compressors shall be provided with guards and shall be mounted adequately to ensure the reduction of noise and vibration. The employees working in noise generating areas shall be provided with earmuffs. The employees shall be trained in the mitigation measures and personal protection measures to be taken to avoid noise related health impacts.

Measures to Control Noise Pollution

An effective hearing conservation program will be undertaken where exposure to industrial noise is capable of producing hearing loss. The objective is to ensure that an employee hearing is not affected during his working life to an extent greater than that usually occurring with age and to preserve it at a level sufficient for normal speech perception.

The following engineering control aspects are identified for further implementation to reduce noise levels/exposure;

- The noise generating sources like motors and compressors will be provided with Casings and guard to reduce the noise levels
- Placing attenuating screens between the operators and the sources.
- Adequate spacing between noise sources and operators will be provided. In free field conditions the sound levels roughly varies with the square of the distance.
- Reflected noise is reduced by use of absorbent materials on roofs, walls and floors.
- By proper maintenance, which corrects vibrations and other imbalances, will be taken up.
- Necessary vibration mitigation measures to ensure least impact on structures and workmen.
- Personal protective equipment: ear plugs and muffs consisting of fine glass wool, ear muffs consisting of ear cups with a soft seal, fitted with a spring or adjustable headband. Comfort, maintenance and cleaning are important aspects of use.

- Plantation of tall as well as short trees around the plant area will protect the outside environment from any noise and dust nuisance.
- It is possible to reduce the noise levels by 3-5 dB (A) per 30-m width of the green belt.

10.3 Rainwater Harvesting *(Terms of Reference No. 7(x))*

Rain water harvesting shall be adopted by providing rain water harvesting structures along the drains, storm water storage sump and tanks. Storm water drains are provided with rain water harvesting structures which will act as flow dissipaters and also as infiltration trenches. Filtration points shall ensure percolation of water and enhance the ground water table. The site area will be provided with 30 nos. of rain water harvesting structures. The storm water from open areas, and green belt area, and the overflow of the roof water storage sump shall be collected in a storm water storage tank in northeast part of the site and reused for plant and process. The storage tank shall have a capacity of 2800 m³. Photographs of existing storm water storage pond is presented in [Fig 10.7](#)



Fig 10.7 Storm Water Storage Pond

10.4 Occupational Safety and Health (Terms of Reference No. 8(iii)& B.12)

Many worker health and safety hazards are posed by plant operations. They include safety hazards from moving machine parts, pressurized equipment and pipes, heavy manual handling of materials and equipment, steam, hot liquids, heated surfaces and hot workplace environments, confined spaces and hazardous energy sources (e.g., electricity); and high noise levels.

Acute and chronic health risks may result from worker exposures to hazardous chemicals during operations. Chemicals with acute health effects can damage the eyes and skin, be corrosive or irritating to body tissues, cause sensitization or allergic reactions or be *asphyxiants*, causing suffocation or oxygen deficiency. Chemicals with chronic health effects may cause cancer, or damage the liver, kidneys or lungs or affect the nervous, endocrine, reproductive or other organ systems. Worker exposure to chemicals can occur during manufacturing when chemicals spill, leak, or discharge from the process system and contaminate areas where workers are present. The most frequently reported industrial exposure occurs during the transfer of materials. The entry of workers into systems, equipment, or enclosures that are contaminated may occur inadvertently, but routine servicing, non-scheduled maintenance, and process monitoring appear to be the kind of activities with potential for significant exposure. Health and safety hazards may be controlled by implementing appropriate control measures (e.g., process modifications, engineering controls, administrative practices, personal and respiratory protective equipment).

The engineering controls for reducing occupational hazards are provision of scrubbers, condenser systems for process equipment, piping systems, insulation, usage of transfer pumps with mechanical seals, level indicators, pressure and temperature indicators, barrier guards on moving machine parts, optimization of chemical inventory, control switches and emergency stop devices to mitigate and avoid physical, chemical, electrical and mechanical hazards.

Work practices for improving occupational safety are induction training programs, safety training programs, rotation of workers, implementation of proactive maintenance schedule, provision of standard operating procedures for all plant operations, access to MSDS for all employees, access to emergency numbers of contact, and avoidance of crowded work place, and provision of occupational safety centre.

Personal protective equipment shall be provided to all the employees including contract employees. All the employees shall be provided with gumshoe, helmet, masks, and goggles. The other equipment like ear muffs, gloves, respirators, aprons etc., will be provided to employees depending on the work area allocated to them. The PPE selection shall strictly follow the prescribed guidelines of MSDS. The budget allocated for personal protective equipment is Rs. 30 lakhs and Rs.10 lakhs for health checkup.

Online chlorine monitors are provided to monitor the chlorine emissions from the hypo tower vent and also to monitor the ambient air quality for Chlorine. All the operations are conducted in closed system.

10.4.1 Medical Check-up (*Terms of Reference No. 8(ii)*)

M/s Sree Rayalaseema Alkalies and Allied Chemicals Limited has a medical program of pre employment screening, periodic medical examination, emergency treatment, non emergency treatment, and record keeping and review. The pre employment screening and periodic medical examination shall follow the guidelines of factories act. The pre employment screening shall obtain medical history, occupational history followed by physical examination and baseline monitoring for specific exposures. The frequency of periodic medical examination and type of evaluation is presented in **Table 10.12**. Annual medical examination report of employees is enclosed at **Annexure**.

Table 10.12 Frequency of Health Monitoring

Occupation	Type of evaluation	Frequency
Process area	Dermatology examination, ophthalmic examination, ENT examination, physical examination, complete blood picture, complete urine examination, ECG, Random blood sugar, Lipid profile, Liver function test, kidney function test, Anemia profile, thyroid	Once a year for regular employees. Half yearly for contract employees

	stimulating hormone, abdomen ultra sound scanning, thread mill test, Spirometry test.	
Noise prone areas	Audiometry	Annually

Pre employment check up will be made mandatory and following test will be conducted:

Plan of evaluation of health of workers

- Chest x rays
- ECG
- Haemogram (examination of the blood)
- Urine (Routine and Microscopic)
- Complete physical examination
 - Musculo-skeletal disorders (MSD)
 - Backache
 - Pain in minor and major joints
 - Fatigue, etc.

Occupational health centre provided emergency and non emergency treatment, by way of emergency first aid on site, liaison with local hospitals and specialists, arranging decontamination of victims, arranging transport of victims to hospitals, and to transfer medical records, and to provide details of incident and medical history to next care provider. The occupational health centre shall be supervised by a qualified physician. The occupational health centre shall maintain the health records and shall analyse the records for any common symptoms and common health problems which may be due to exposure to chemicals, and or due to other occupational hazards.

10.4.2 Treatment of Workers affected by Accidental Spillage of Chemicals

The following is the standard procedure followed in Plant;

- On receiving message of casualty at ECC, Ambulance is sent to the plant / location of occurrence.
- Give topmost priority to the “personal Safety of employees”. Prevention of life is the number priority and people must be removed from the danger area and shifted for medical treatment as early as possible.

- The casualty is rendered first aid by trained first aiders.
- The casualty then shifted to OHC in Ambulance for further treatment.
- Medical aid is administered by FMO / Manager - OHC at OHCS.
- On the Company Manager – Occupational Health assessment, the casualty is transported in Ambulance to defined hospitals for further treatment.

Toxic release gas:

- Check wind direction of wind sack installed at highest point (AC II, AC-IV & PIC) and stay upwind at 90°.
- Wear appropriate / necessary PPE if moving near gas leakage area.
- Rescue operators must wear SCBA set before entering the affected section.
- Monitoring of the emission levels in the immediate vicinity by on-duty Environment Protection Manager (Dragger Tubes / PID instrument / Gas detector tubes)
- Mayura Water curtains to be started immediately to control drift of gases away from leak spot.
- Contaminated water is to be diverted to effluent treatment plant. Coordination with ETP personnel is a must.

10.5 Prevention, maintenance and operation of Environment Control System

The pollution control equipment, and the effluent treatment systems and effluents will be monitored periodically and will be checked for its performance and pro-active maintenance will be adopted. The environmental monitoring results will be evaluated to identify the problems/under performance of the equipment. Necessary steps will be taken to rectify the identified problems/defects. The management agrees that the evaluation of the performance of pollution control measures and occupational safety measures to arrive at their efficiency and proposes to adopt new measures for efficient pollution control which will be a regular exercise.

All pollution control equipments are adequately designed and operating staff of the pollution control equipment have good experience in the operation and maintenance of the

equipment. Standby equipment provided for all critical equipment to ensure continuous operation of pollution control equipment and preventive maintenance is done as per the schedule to avoid breakdown. Characteristics of influent and effluent are monitored on daily basis by the industry and air emissions and effluent characteristics on monthly basis by third party.

10.6 House Keeping

Good house-keeping practices will be adopted. Floor washing is avoided and wet mopping will be adopted to minimize liquid waste generation. Paper waste is minimized by adopting intra office network. Sufficient workspace and proper lighting will be provided.

10.7 Socio Economic Environment

The expansion of project provides an opportunity for the local people to get employment directly or indirectly and helps in the upliftment of the socioeconomic status of the area. The project proponents propose to involve in social activities of the stakeholders/surrounding community by planning the betterment of neighbouring social conditions through awareness and welfare programs will ensure an improved relation, useful in the long run. Many of the beneficiaries of such programs shall include own employees as well. The goodwill of the local populace can never be ignored. Another important facet of social environment identified by the project proponents is a green appearance, hence the management will develop a green belt towards aesthetic beautification as the same is necessary to be considered as a responsible, social neighbour. The budget allocated for funding corporate social responsibility activity is Rs. 9 crores or 2.5% of the capital cost to be spent during the first 5 years of the project. The development programs are identified from schedule VII of companies act 2013. A tentative list of development programs to be adopted as part of CSR activity, with approximate budget allocation is presented in [Table 10.13](#). The expenditure shall be mainly towards provision of drinking water, gender development, skill development, and provision of infrastructural facilities for drinking water, education and health. The programs identified by the management as part of corporate social responsibility program are presented in [Table 10.14](#).

Table 10.13 Corporate Social Responsibilities - Budget (2018-19 to 2022-23)*(Terms of Reference No. 11(i))*

Description	TOTAL COST (Rs. IN LAKHS)				
	2018-19	2019-20	2020-21	2021-22	2022-23
Skill Development Training Programme	37	37	37	43	43
Drinking Water Facility	47	47	43	36	36
Health Camps	47	43	43	36	36
Education	36	36	36	47	47
Others	18	18	17	17	17
Total (Rs. Lakhs)	185	181	176	179	179

Table 10.14 Activity Wise CSR - Budget (2017-18 to 2021-22) - Program

S. No	Description	TOTAL COST (Rs. IN LAKHS)				
		2018-19	2019-20	2020-21	2021-22	2022-23
1	Socio-economic Development & Enriching Livelihood Includes activities relating to income generation like skill development programs, Roads, Drinking water facility, sanitation to nearby villages.	68	68	68	68	68
2	Value addition and necessary improvements in Government Schools Includes construction of toilet blocks, carrier counseling, promoting education, including special educational and employment enhancing vocation skills for students, etc.	36	36	36	47	47
3	Care for the Needy Eradicating hunger, poverty and malnutrition. Identification of old age homes, orphanage, differently abled persons, etc. Take care of their requirements.	13.0	12.5	12.5	12	12
4	Health & Environment Conducting general health camps in the nearby villages, government schools, Creating environmental awareness, display of materials, sapling of trees, etc.	40	40	40	36	36
5	Infrastructure Take care of the local community by construction of bus shelters, providing facilities in the Government Primary Health Centers, Government Hospitals.	20	20	20	22	22
	Total (Rs. Lakhs)	177	176.5	176.5	185	185

10.8 Transport systems (Terms of Reference No. 7(iii))

All the raw materials and finished products are transported by road. Dedicated parking facility is provided in an area of 2550 sq.m for transport vehicles. There will be 230-250 truck trips per day to the factory. Traffic signs are placed in the battery limit. The drivers of the vehicles will be provided with TREM cards and will be explained the measure to be adopted during various emergencies. Drivers transporting hazardous chemicals are periodically trained. **Fig 10.8** shows photographs of drivers training programme.

The truck trips shall be staggered to ensure the maximum 20 truck trips per hour. It is also proposed to avoid material transport to and from the plant during 8 to 10 AM and 4 to 6 PM. It is also proposed to utilize returning trucks for product/ waste transport to reduce the number of truck trips.



Fig 10.8 Photographs of Drivers Training Programme

10.9 Reduce, Recovery and Reuse

The expansion of chloromethanes concentrate on increasing the yields, using less quantity of raw material adopting green chemistry principles. The steam condensate shall be reused for boiler feed. Treated effluent is reused for brine make-up and scrubbers. A cross functional team shall constantly evaluate various options of reduce, reuse and recycle for water conservation, reduction in wastewater generation, effluent segregation, reuse of wastes, alternate treatment methods, leakage/spillage control, avoidance of overflow and contamination.

10.10 Energy Conservation

The chlor-alkali industry is energy intensive; hence it is proposed to adopt latest membrane technology, and required electrical hard ware to ensure reduced energy consumption. The proposed membrane technology consumes 1540 kWh/T of product in place of 2055 kWh/T consumption. It is proposed to use screw compressors (Air/Refrigeration) for energy efficiency (10 – 12% saving), evaporative condensers in the chilling circuit to reduce overall power, Cooling tower fan control to switch off at times not required (Low temp), energy efficient pumps to conserve energy.

10.11 Green Belt Development (*Terms of Reference No. 7(ix)*)

The management developed green belt in a total area of 89.03 ha covering the boundary of the site as part of environment management plan and proposed to increase density to enhance environmental quality through mitigation of fugitive emissions, attenuation of noise levels, balancing eco-environment, prevention of soil erosion, and creation of aesthetic environment. It has a fully fledged Environment monitoring management cell. Greenbelt plan presented in [Fig. 10.9](#)



Green Belt Photographs



10.12 Corporate Environmental Responsibility (Terms of Reference No. 9(i))

The broad guidelines of the Environmental Policy are presented below. The environmental Management System shall have standard operating procedures for various aspects identified which include infringement/deviation/violation of Environmental related statutory regulations.

Broad guidelines of the Environmental Policy

- Integrating environmental considerations into work practices at all levels; Informing employees and associates of applicable environmental regulations and SRAACL requirements;
- Providing the resources necessary for employees and associates to conduct their work in accordance with applicable environmental regulations and SRAAC L requirements;
- Developing environmental goals and targets relevant to SRAACL operations and taking actions to achieve those goals and targets;
- Promoting pollution prevention, waste minimization, and conservation; Promoting the effective use of innovative environmental technologies and practices;
- Fostering a work environment in which employees and associates are encouraged to report and raise environmental issues without fear of retaliation;
- Continually improving the effectiveness and efficiency of environmental management through assessments and performance and cost metrics;
- and Complying with applicable laws, regulations and other promulgated environmental requirements.

10.13 Environment Management Cell (Terms of Reference No. 10(iii) & (iv))

Executive director, Director – Technical, Sr. Manager – Environment and Sr. Manager – Safety will take the final responsibility for environmental Management and Safety control. The Environmental Manager and staff will supervise the day-to-day activities of the environmental management and control. The organ gram of the Environment management cell is presented in **Fig 10.10**.

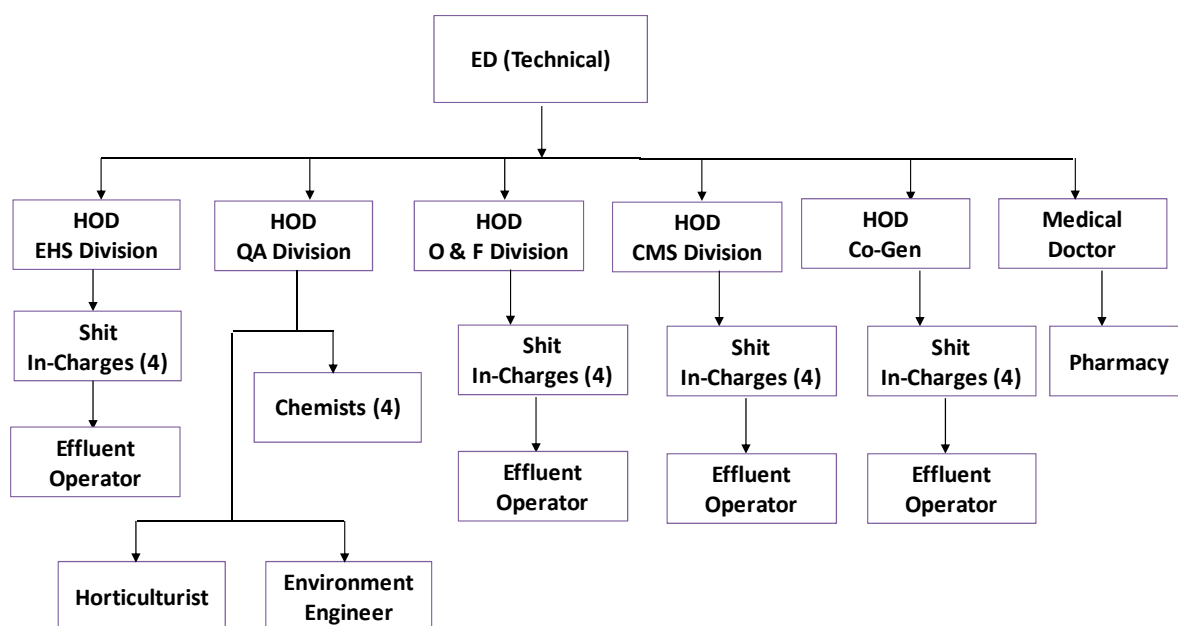


Fig 10.10 Organ gram of the Environment Management Cell

Records shall be maintained for the analysis of raw effluents and treated effluents, ambient air quality data, stack emissions monitoring results, micro- meteorological data and noise levels. These records are not only required for the perusal of the pollution control board authorities but also to derive at the efficiencies of the pollution control equipment as the objective of the project proponent is not only compliance with statutory regulations, but also a serious commitment towards clean environment.

The industry shall be regularly maintaining the records as per the hazardous waste regulations and EPA regulations and is applying for the annual consents for air and water, and renewal of authorization for the storage of hazardous waste.

10.14 CREP Guideline and Compliance

CREP Guideline	Compliance
Complete recycling of mercury bearing effluent by December 2003.	Not Applicable, the unit will adopt membrane cell technology based process which does not use Mercury.
Installation of continuous on-line mercury analyzer by June 2003.	Not Applicable
Treatment of cell-room ventilation gas - limit for	Not Applicable

mercury not to exceed 1 gm/t of product by December 2005.	
De-mercerisation of caustic soda & limit for mercury in caustic soda at 0.1 gm/of product by December 2004.	Not Applicable
Reduction of mercury in H ₂ gas at 0.5 gm/t by December 2004.	Not Applicable
Installation of common full-fledged salt washer unit at source by Dec. 2003.	Not Applicable
Capping existing completed disposal sites by June 2004 (Action plan to be submitted by June 2003).	Not Applicable
Brine sludge treatment and water leachable mercury content in brine mud at < 0.1 mg/l before disposal in Secured Landfill.	Not Applicable
Reduction of mercury consumption at < 50 gm/t of product by December 2005.	Not Applicable
Total mercury release to environment at < 2.0 gm/t of product by December 2005.	Not Applicable
The mercury cell plants will switch over to membrane cell Technology in a time bound manner for which action plan will be prepared by respective plants within six months.	Not Applicable
Industry to submit action plan covering the pollution and safety aspects for Cl ₂ handling to prevent any accident/ release of Cl ₂ within three months.	The onsite emergency management plan addressed the safety and pollution aspects of Cl ₂ handling to prevent accident/release.

10.15 Other Management Practices

The industry will maintain records as per the hazardous waste regulations and EPA regulations and apply for the annual consents for air and water, and renewal of authorization for the storage of hazardous waste as per Hazardous Waste (Handling & Management) Rules, 1989 and subsequent amendments. The records of hazardous waste manifest will be maintained.

The industry shall obtain the consent for operation (CFO) as required under section 25/26 of the Water Act, 1974 and under section 21/22 of Air Act, 1981 before trial production and commissioning from the State Pollution Control Board. The CFO will be renewed each year by the industry. The industry will obtain the necessary permissions under Hazardous Waste (Management and Handling) Rules 1989, and Manufacture, Storage and Import of

Hazardous Chemicals Rules, 1989, issued by the Ministry of Environment and Forests, New Delhi. The industry will submit environmental statement every year before September 30, and monthly water cess returns. The management ensures that it will comply with all the directions and regulations issued by the Ministry of Environment and Forests, New Delhi, State and Central Pollution Control Boards. The Consent for Establishment, Consent for Operation will be displayed in a conspicuous location for the information of the inspecting authorities of different departments.

10.16 Cost Estimate for Environment Management Plan (*Terms of Reference No. 7(xi)*)

It is estimated that the total capital cost for implementing the Environment Management plan is Rs. 320 Lakhs, while the recurring costs for the same is Rs. 652.2 Lakhs/year. The cost estimate is presented in [Table 10.15](#).

Table 10.15 Environmental Management Cost estimate

S.No	Description	Capital	Recurring Cost
1	Air pollution Control	100	500
2	Water pollution Control	100	70
3	Noise pollution Control	5	0.2
4	Environment Monitoring and Management	50	10
5	Occupational Health	30	20
6	Green Belt	20	10
7	Others (S. Waste)	15	42
Total (Lakhs)		320	652.2

Note: Value in Rs. Lakhs

CHAPTER 11.0 EXECUTIVE SUMMARY

11.0 Introduction

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) a group company of TGV group; has established a Caustic soda manufacturing unit at Gondiparla village, Kurnool mandal in Kurnool district, Andhra Pradesh. TGV group established Caustic soda plant in 1987 and expanded in various phases during the last 20 years by adopting most modern, energy saving, environment friendly membrane process technology. The unit obtained ISO 9001, ISO 14001 and OSHAS 18001 certifications.

M/s. SRAAC obtained latest Environment Clearance Vide file no. F. No. J-11011/619/2009-IA.II (I), dt. 14.02.2012. It is proposed to expand the manufacturing capacity of Chlor-Alkali, Chloromethanes and inclusion of Chlorodifluoromethane plant in the existing area of 152.4 ha. The capital cost for expansion is Rs. 360 crores, towards enhancement of effluent treatment plant, production facility, pollution control equipment and additional equipment to enhance the capacity. Prior environmental clearance is mandated by Ministry of Environment and Forests, vide SO 1533, dated September 14, 2006, for chlor-alkali industry and synthetic organic chemicals manufacturing activity. The terms of reference for the environmental impact assessment studies was obtained from MoEF&CC vide letter no. F.No. J-11011/84/2016-IA II (I) dated 21.06.2016 and the Public Hearing was conducted on 29.11.2017 as part of environmental clearance process. The certified compliance letter from the regional office of MoEFCC, Chennai is obtained vide letter no. 29.09.2016/1927 dated 29.09.2016.

11.2 Location of the Project:

The plant site is located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The site is located at the intersection of 15° 49' 30" (N) latitude and 78° 4' 30" (E) longitude. The site elevation above mean sea level (MSL) is 300 m. The plant site is surrounded by open lands in east direction, Sree Rayalaseema Hi-Strength Hypo Limited (SRHHL) in north direction, Road connecting the NH-7 with Gondiparla village in the south and west directions. The nearest habitation from the plant is E.Tandrapadu village located at a

distance of 0.5 km in northwest direction. The main approach road is NH-7 - Gondiparla village adjacent to the site in northwest direction. The nearest Town and Railway station is Kurnool at a distance of 3.5 km in northwest direction and nearest airport is Shamshabad located at a distance of 165 km in northeast direction. Tungabhadra River is flowing from northwest to southeast direction at a distance of 1.5 km in south direction. Interstate boundary between Telangana and Andhra Pradesh is at a distance of 1.3 km in northeast direction. There are two reserve forests in the study area. Gadidmadugu RF at a distance of 5.5 km in east direction. Pullaiah RF at a distance of 9.3 km in southwest direction. There are no National Parks, sanctuaries and critically polluted area within the impact area of 10 km surrounding the site.

11.3 Product Profile

The manufacturing capacity of proposed products after expansion is presented in the **Table No. 11.1**.

Table 11.1 Manufacturing Capacity

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	--	50
7	Sodium Sulphate	TPD	--	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride*	TPD	7.6	7.6	15.2
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	--	10	10
2	Hydrochloric Acid (100 %)	TPD	--	8.27	8.27
IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	--	76
2	Power generation Furnace Oil**	MW	31	--	31
V. Oil and Fatty Acid Division					
1	Oil and Fatty Acid Products (Non EC Products)	TPD	498	--	498

*Carbon Tetrachloride (CCl₄) generated will be sold as a feed stock to Authorized users/excess will be incinerated.

** Shall be kept as standby.

11.4 Manufacturing Process

The manufacturing technology chosen for chlor-alkali plant is membrane technology which is environment friendly. The by-products are hydrogen, chlorine and sodium hypo chloride. Hydrochloric acid is manufactured using H_2 and Cl_2 produced from cell house.

Chloromethanes (CMS) is manufactures by hydro chlorination of methanol in vapor phase in presence of catalyst followed by thermal chlorination of methyl chloride in vapor phase with chlorine and rectification, azeotrope separation and dehydration of the mixed products.

Chlorodifluoromethane (R22) is produced by reacting chloroform with hydrogen fluoride. This reaction involves generation of HCl as by product. The refrigerant R22 along with HCl will evolve from the reactor in gaseous form. This is to be cooled and HCl absorbed in Hydrochloric acid absorption system, to produce 28 to 30% HCl.

11.5 Utilities

No additional utilities are proposed for expansion. The required steam will be met form existing coal fired boiler. It is proposed to establish standby DG sets of capacity 500 Kva in addition to existing stand by DG sets. The list of utilities is presented in [Table 11.2](#).

Table 11.2 List of Utilities

S.No	Description	Existing	Proposed	Total after expansion
1	Coal Fired Boiler	110 TPH	-	110 TPH
		100 TPH	-	100 TPH
		45 TPH	-	45 TPH
2	DG Sets**	5 x 6.2 MW	-	5 x 6.2 MW
		1 x 160	-	1 x 160
		1 x 285	-	1 x 285
		1 x 400	-	1 x 400
		1 x 500	1 x 500	2 x 500
3	Oil and H ₂ fired boiler*	3 TPH	-	3 TPH
4	WHRB connected to DG sets*	3 TPH	-	3 TPH
5	Oil fired boiler*	3 TPH	-	3 TPH

*DG sets will be used during load shut down by AP Transco.

11.6 Water Requirement

The water required for the plant is mainly for brine preparation, Scrubbers, and washings, cooling tower makeup, process, steam generation and domestic purposes. The total water requirement shall increase from 12.137 MLD to 15.684 MLD out of which 15.167 MLD shall be fresh water and 0.517 MLD shall be recycled water. The required water is drawn from Tungabhadra River through infiltration wells. The unit obtained permission to abstract water from Tungabhadra River in the order of 20MLD. The total water requirement is presented in **Table 11.3**.

Table 11.3 Total Water requirement

S.No	Description	Quantity (MLD)		
		Existing	Proposed	Total after expansion
1	Chlor-Alkali Plant (or) Potassium Hydroxide	1.98	1.765	3.745
2	Oil and Fatty Acid	0.317		0.317
3	Chloromethanes	0.85	0.845	1.695
4	Chlorodifluoromethane	---	0.42	0.42
5	Co-generation Power Plant	8.99	---	8.99
	Total	12.137	3.03	15.167

11.7 Baseline Environmental Data

The baseline data was collected in the study area during December 2016 – February 2017. The baseline data includes collection of Samples of ground water, surface water and soil, monitoring of ambient air quality, noise levels, ecological status and meteorological parameters. The analytical results show that the values are within the prescribed limits for air quality. The ground water quality is observed to be above the limits for potable purpose when compared to the prescribed standards of IS: 10500 – 2012 at few locations.

11.8 Identification and Quantification of Impacts

The impact assessment report has identified various sources of pollution and quantified the pollution loads due to proposed expansion. It has also identified the technologies to be adopted for the mitigation and control of the same. The sources of pollution are air emissions from utilities and scrubbers; liquid effluents from scrubbers, utilities and domestic usage; solid wastes from process, treatment systems and utilities; and noise pollution from utilities, and process equipment.

11.8.1 Impacts on Air quality: The impacts on air quality shall be due to proposed expansion is from standby DG set of 1 x 500 capacity and existing the emissions from,

Coal Fired Boilers and standby DG sets. The incremental concentrations are quantified using ISC-AERMOD model based on ISCST3 Algorithm, considering the emissions from the proposed utilities of both SRAACL and Sree Rayalaseema Hi-Strength Hypo Limited. The results indicate marginal increase in ambient air quality concentration. The predicted values for SPM, PM₁₀, PM_{2.5}, SO₂ and NO_x are 11.53, 0.61, 0.27, 5.79 and 5.89 µg/m³ respectively and the maximum values are observed at a distance of 1.9 km from the center of plant site in southwest. The cumulative values of baseline air quality combined with predicted values are found to be within the prescribed limits of National Ambient Air Quality Standards. The mitigative and control measures of air pollution shall ensure that the impact on air quality is local – within the site area and its surroundings.

11.8.2 Impacts on Water: Water is essentially used for brine makeup and utilities and domestic purposes. The total fresh water required of quantity 15.167 MLD after expansion will be drawn from Tungabadra River through infiltration wells in addition to recycled water of 0.517 MLD. No impact on water quality is expected due to discharge of effluents treated effluents are reused for brine make-up and process.

11.8.3 Impacts on Noise quality: The noise levels may increase due to motors, compressors, DG set and other activities. The major source of noise generation is DG set which emit noise level ranging from 90 dB (A) to 110 dB(A) at a reference distance of 1m from the source. The predicted cumulative noise levels (as calculated by the logarithmic model without noise attenuation) ranged between 55 and 75 dB(A) at distances of 87 to 165 m.

11.8.4 Impacts on Soil: The solid wastes generated from brine preparation, utilities and effluent treatment plant may have significant negative impacts if disposed indiscriminately. The brine sludge will be sent to secured land fill within plant premises after recovery of barium sulfate from sludge. The operational phase impacts shall be neutral due to effective implementation of mitigative measures in handling, storing and transferring of solid wastes, effluents and chemicals.

11.8.5 Impacts on Ecology: There are no endangered species of flora and fauna in the impact area. The impact on biological environment is neutral with the effect confined mainly to the site area.

11.9 Environmental Monitoring Programme

SRAACL is monitoring Ambient Air Quality (AAQ) for PM₁₀, PM_{2.5}, SO₂ and NO_x, work room for Chlorine concentrations, stack emissions for boiler, scrubbers and DG sets, noise levels on quarterly basis. Water and treated wastewater are monitored on daily basis, Soil analysis is done once in a year and the same is practiced after expansion also.

11.10 Additional Studies

Risk assessment was conducted and the heat radiation damage distances of pool fire in the bulk storage tanks tank farm was limited to 11m for a heat radiation of 4 KW/m², and the same was within the plant premises.

11.11 Project Benefits

There is a potential for direct/indirect employment of about 300-400 people during construction phase and 350 during operation phase due to the proposed expansion. The project shall have positive impact on socioeconomic environment due to provision of employment both direct and indirect and proposed CSR activities. There will be direct and indirect benefit to government and local body by way of taxes.

11.12 Environment Management Plan

The management plan is drawn in consultation with project proponents and technical consultants after evaluating various mitigation and control measures to address the impacts identified, predicted and monitored. The impacts during construction stage are temporary and less significant, the management plan for impacts identified during operation stage is described as follows;

11.12.1 Liquid Effluents

The main sources of effluent generation from the plant are from scrubbers, floor washings, blow downs from boiler and cooling tower and domestic effluents. Effluents from scrubbers, washings, utility blow downs and domestic wastewater of Chlor-Alkali, Oil and fatty acid division and co-generation power plant will be sent to the effluent

treatment system and treated effluent reused for greenbelt development and process. Effluent from chloromethanes and proposed chlorodifluoromethanes are sent to effluent treatment followed by RO. RO permeate is reused for process and rejects are recycled for brine saturation of Chlor-alkali plant. Total Effluent generated in the existing plant for proposed expansion is presented in **Table 11.4**.

Table 11.4 Total Effluent Generated and Mode of Treatment

S.No	Description	Quantity (KLD)		Mode of Treatment/Disposal
		Existing	Proposed	
I	Chlor-Alkali (Or) Potassium Hydroxide			
1	Process	97.5	94	Sent to effluent treatment plant and treated effluent reused for greenbelt development.
2	Washings			
3	Gland Seal			
4	Cooling towers blow down	82.5	62.5	
5	Domestic	85	8	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - I	265	165	
II	Chlormethanes and Chlorodifluoromethanes			
1	Cooling towers blow down	57	57	Sent to effluent treatment plant of Chlor-alkali followed by Ultra filtration and RO. Permeate reused for process and rejects sent for brine saturation.
2	Scrubbers	20	20	Sent to Brine make-up in chlor-alkali plant
3	Domestic	10	5	Sent to Sewage treatment plant and treated wastewater reused for greenbelt development.
	Total - II	87	82	
III	Co-Generation Power Plant			
1	Floor Washings	30	---	Sent to effluent treatment plant and treated effluent reused for greenbelt development.
2	Cooling towers blow down	600		
3	Domestic	50		
4	DM Plant /RO Rejects	405	---	330 KLD is reused for Brine make-up in chlor-alkali plant and 75 KLD reused for green belt development.
	Total -III	1085	---	
IV	Non EC Products	50	---	Sent to effluent treatment plant and treated effluent reused for greenbelt development
Grand Total (I+II+III+IV)		1507	247	

11.12.2 Effluent Treatment System

The effluents generated are collected in equalization tank followed by neutralization by using acid/alkali and pumped to pre-setting tank. After primary settling for 2.5 hours the

effluents are passed to flocculent mixer where the flocculent are added. After mixing the effluent, it is settled in secondary clarifier for nine hours where the flock will be settled in the tank. The clarified effluent will be passed to treated effluent storage tank. The settled sludge in presettler and secondary clarifier will be pumped to sludge drying beds.

11.12.3 Air Pollution

No additional boiler is proposed for the plant except 1 x 500 KVA standby DG Set. The sources of air pollution from the plant are from 1 x 45 TPH, 1 x 100 TPH, 1 x 110 TPH coal fired Boilers, DG sets and Incinerator in chloromethane plant. The existing air pollution control equipment for coal fired boilers is Electro static precipitators (ESP). DG set shall be provided with stack heights based on the CPCB formula for effective stack height based on the CPCB formula.

The gaseous emissions from Chlor-Alkali process are Chlorine and Hydrogen Chloride vapors. Scrubbers are provided to neutralize sniff gases effectively. Dilute Chlorine is reacted with caustic to obtain sodium hypochlorite which is a value added product. Due to advancement of control checks and due to membrane cell electrolysis, possibility of chlorine emission to atmosphere is negligible. The second gaseous pollutant from chloro-alkali plant is hydrogen chloride gas emissions. To avoid emissions in the plant, tail gas vents are connected to a venturi scrubber and the lean acid formed is used for absorption of Hydrogen chloride gas in absorber.

The gaseous emission from Chloromethane plant is chlorine and hydrogen chloride vapours. Due to advancement of control checks and due to membrane cell electrolysis, possibility of chlorine emission to atmosphere is negligible. HCl gas produced from thermal chlorination unit is used to produce methyl chloride. Excess HCl available is absorbed in HCl absorber to produce 32% HCl. To avoid emissions from HCl absorber, tail gas vents are connected to a tail gas tower followed by organic stripper to remove organics.

The gaseous emission from Chlorodifluoromethane plant is HCl which is sent to Hydrochloric acid absorption system, to produce 28 to 30% HCl.

11.12.4 Solid Waste

Sludge is generated during brine purification stage, and barium sulfate is recovered from the sludge to be sold as by product. The sludge generated from effluent treatment plant will be disposed to landfill which contains mostly inorganics. Used silica gel, calcium chloride, Calcium Fluoride, Antimony Pentoxide and Spent Sulfuric Acid are the wastes generated from the Chloromethane and Chlorodifluoromethane process. Used silica gel and calcium chloride are sent to secured landfill within plant premises. Spent sulfuric acid sold as by-product and Calcium Fluoride is sold to hydrogen fluoride manufacturers. Waste oil and used batteries from the DG sets are sent to authorized recyclers. Other solid wastes expected from the unit are containers, empty drums which are returned to the product seller or sold to authorized buyers after detoxification. Coal ash from boiler is sold to brick manufacturers.

11.12.5 Noise Pollution

Noise is anticipated from turbines of captive power plants, motors, compressors, centrifuges and DG sets. DG set shall be provided with acoustic enclosure. Motors and compressors shall be mounted properly to ensure reduction of noise and vibration. Employees working in noise generating areas shall be provided with appropriate personnel protective equipment.

11.12.6 Occupational Safety and Health

Direct exposure to chemicals or its raw materials may affect health of employees. Direct exposure to hazardous materials is eliminated by providing closed handling facilities. Personal Protective Equipment (PPE) i.e., hand gloves, safety goggles, safety shoes, safety helmets, respiratory masks etc. are provided to all the employees working in the plant. Company has a policy of providing PPEs to all personnel including contract workers. Periodic medical checkup in addition to checkup during recruitment is adopted to monitor health status of employees. Online chlorine, VOC monitors shall be installed to monitor the ambient air quality and work room air quality, while chlorine sensors are also used for identifying potential hazard areas.

11.12.7 Prevention, maintenance and operation of Environment Control Systems

The pollution control equipment, and the effluent treatment system is monitored periodically to estimate their efficiency and performance potential as part of adoptive management. Proactive maintenance and monitoring program for all equipment and machinery is adopted to identify the problems/under performance of the equipment. Necessary measures will be adopted to rectify the identified problems/defects. The management agrees that the results of monitoring will be reviewed periodically to adopt new measures if necessary, for efficient pollution control.

11.12.8 Transport systems

All the raw materials and finished products are transported by road. Dedicated parking facility is provided for transport vehicles. There will be 230-250 additional truck trip per day to the factory for transporting raw materials and finished products. Traffic signs will be placed in the battery limit. The drivers of vehicles will be provided with TREM cards of chemicals and materials to be transported, and will be explained the measure to be adopted during various emergencies

11.12.9 Reduce, Recycle and Reuse

A number of measures are proposed to achieve high yields and reduce generation of wastes. Barium sulfate recovered from sludge is sold as by-product. It shall be endeavor of the R&D team to improve yields through constant research and development activities. Treated effluent is reused for brine make-up and process.

11.12.10 Green Belt Development

The management developed green belt in a total area of 89.03 ha and proposed to increase density to enhance environmental quality through mitigation of fugitive emissions, attenuation of noise levels, balancing eco-environment, prevention of soil erosion, and creation of aesthetic environment.

11.12.11 Post Project Monitoring

Environmental monitoring for water, air, noise and solid waste quality shall be conducted periodically either by proponent or third party. The frequency of monitoring

and the quality parameters shall be as suggested by the Ministry of Environment and Forests and Climate Change, Government of India.

11.12.12 Environment Management Department

Executive director, Director – Technical, Sr. Manager – Environment and Sr. Manager – Safety will take the final responsibility for environmental Management and Safety control. The Environmental Manager and staff will supervise the day-to-day activities of the environmental management and control.

CHAPTER 12.0 DISCLOSURE OF CONSULTANTS ENGAGED

Declaration by Experts Contributing to the EIA

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator:

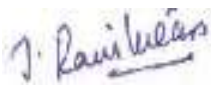
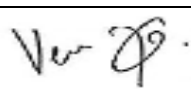
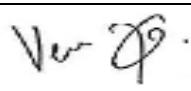
Name: **G.V. Reddy**

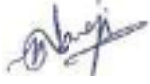
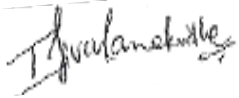



Signature and Date: **January 12, 2018**

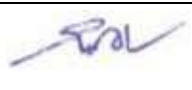
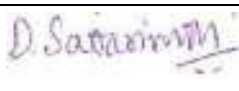
Period of involvement: **January 2016 to till date**

Contact information: **Team Labs and Consultants, B115 - 117, 509, Aditya Enclave, Ameerpet, Hyderabad 500038.**

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**) Period of involvement : January 2016 till date	Signature and date
1	AP	T.Ravi kiran	Site visit, Design of AAQ network, supervision of AAQ monitoring, Compilation of emissions and characteristics, assessment of impacts due to the proposed expansion, identification of mitigation measures, preparation of EMP for AP, Preparation of monitoring plan for AP.	
2	WP	G.V.Reddy	Site visit, identification of monitoring stations, supervision of sampling, Characterization of effluent streams, segregation of effluent streams, ZLD for effluent treatment, assessment of impacts due to the proposed expansion, identification of mitigation measures, preparation of EMP for WP, Preparation of monitoring plan for WP.	
3	SHW	G.V.Reddy	Site visit, Characterization of solid wastes, storage, and disposal plan for various solid wastes, assessment of	

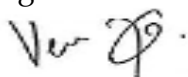
			impacts due to the proposed expansion, identification of mitigation measures, preparation of EMP for SHW.	
4	SE	K. Nanaji	Site visit, primary and secondary data collection of the impact area, assessment of impacts due to the expansion project on socio economic status and project economy, preparation of CSR plan, Preparation of SE part of EIA report.	
5	EB	I. Sivarama Krishna	Site visit, primary and secondary data collection related to ecology and biodiversity, assessment of impacts based on IAIA guidelines, preparation of mitigation measures, preparation of green belt plan and cost estimate, preparation of EB part of EIA report.	
6	HG	G.V.A. Ramakrishna	Identification of water sheds of the area by preparing the drainage map, assessment of ground water potential of the site and impact area, preparation of rain water harvesting plan, assessment of impacts due to ground water abstraction and mitigation measures.	
7	SC	D. Sundar Rao	Identification of soil sampling locations and characterization of the soils, interpretation of soil analysis reports, assessment of impacts due to spillages, accidental releases of chemicals, effluents etc., and mitigation measures.	
8	AQ	M. Srinivasa Reddy	Assisting AP FAE in identifying the AAQ monitoring stations by providing normal climatological and other historical data, Identification of Micrometeorological data monitoring station, supervision of met data collection using Automatic weather station, Preparation of emission details, Air quality impact prediction modeling, Calculation of work room concentrations of solvents using box model, Assessment of results and preparation of isopleths, assisting the AP FAE and EIA coordinator in preparation of EMP.	

9	LU	G.V.A. Ramakrishna	Preparation of land use land cover map using satellite imagery, ground truth study, assessing the impacts due to expansion. Preparation of FAE report.	
10	RH	D. Sadasivudu	Site visit, assessment of hazop reports, identification of sources of hazards, assessment of storages proposed in comparison with statutory regulations and calculation of FETI to assess the scope of risk assessment, preparation of isopleths for various scenarios as part of consequence analysis, identification of mitigation measures preparation of disaster management plan.	

Declaration by the Head of the accredited consultant organization/ authorized person

I, G.V. Reddy hereby, confirm that the above mentioned experts prepared the EIA report for M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:



Name: G.V. Reddy

Designation: Director

Name of the EIA consultant organization: Team Labs And Consultants

NABET Certificate No: S. No. 141 of List 'A' – Accredited EIA Consultant Organizations complying with Version 3 of the Scheme - as on Rev. 61 January 05, 2018

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

3. PUBLIC CONSULTATION

**Project No. 0118-13-03
January 2018**

**Sree Rayalaseema Alkalies and Allied Chemicals Limited
Gondiparla Village, Kurnool District,
Andhra Pradesh – 518 004
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E-mail: sraaclabs@rediffmail.com**

**STUDIES AND DOCUMENTATION BY
TEAM Labs and Consultants
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Hyderabad-500 038.
Phone: 040-23748 555/23748616,
Telefax: 040-23748666**

**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**

13. PUBLIC CONSULTATION

13.0 Introduction

The Ministry of Environment, Forest and Climate Change, (MoEF&CC) Government of India issued Environmental Impact Assessment notification S.O. 1533 dated September 16, 2006 mandating prior environmental clearance for Chlor-alkali industry and synthetic organic chemicals manufacturing activity under category 'A' for projects located outside notified industrial area/estate. The proposed expansion project of Sree Rayalaseema Alkalies and Allied Chemicals Limited is located at Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The proponents obtained the terms of reference from the MoEF&CC, which mandated public consultation vide letter no. F.No. J-11011/84/2016-IA II (I) dated 21.06.2016. Accordingly the draft Environmental Impact Assessment was submitted to APPCB Regional Office, Kurnool for conducting public hearing. The public hearing for the proposed expansion was conducted on 29.11.2017 near industry site. The public hearing was chaired by Sri S. Satyanarayana., I.A.S., Collector and District Magistrate, Kurnool District and Sri P. Prasada Rao, Environmental Engineer, Regional Office, Andhra Pradesh Pollution Control Board, Kurnool.

13.1 Advertisement

Advertisement regarding date, time and venue of the Environmental public hearing for proposed expansion was issued in "Andhra Jyothi" (Telugu daily) and "The New Indian Express" (English daily) newspapers on 28.10.2017. Copy of the advertisement is enclosed.

Minutes of the meeting

The minutes of the public hearing is enclosed along with the attendance sheet. Concerns expressed by speakers during public hearing and responses of the proponent are presented in table 7.1. Response to written representations is presented in Table 7.2.

13.2 Concerns expressed by public

Table 13.1 Concerns Raised in Public Hearing and Responses

S.No	Issue raised by	Issue	Proponent's Response
1	Sri K. Somanna, Ex-Sarpanch, Gondiparla Village	He informed the gathering that earlier he was Sarpanch of Gondiparla village for about 18 years and informed that at present his wife is a sarpanch of Gondiparla village. He informed that after inception of the industry in their village the basic amenities such as roads, drainage facilities, and drinking water facilities have been improved. He also informed that the management has provided drinking water facility in their village by installing 2 No's of drinking water RO plants and also extended their support for establishing another 2 No's of RO plants in their village through Panchayatraj funds. He informed that, recently the chairman of the industry through Govt have sanctioned about Rs. 2.0 Crores for the development of roads and also about Rs. 50 lakhs for developing indoor stadium in the village. He requested the Collector & District Magistrate, Kurnool District to provide required land for developing indoor stadium. He informed that the chairman of the company is developing their village by providing irrigation facilities, providing employment to their villagers. He has informed that they are welcoming the proposed expansion activity on behalf of their village and requested the management to give priority to their villagers in the employment opportunities in the expansion project.	<p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p> <p>The proponent informed that the indoor stadiums at Panchalingala, Gondiparla were sanctioned and also informed that the necessary land required for indoor stadium at Panchalingala is acquired and for Gondiparla it is in process.</p>
2	M. Nagaraj, MPTC, Gondiparla Village	He informed that since inception of the industry in their village the industry has developed their village by providing roads, drainage facilities, etc., and informed that the Chairman of the Company is	The proponent has informed that the Indoor stadiums at Panchalingala, Gondiparla were sanctioned and also informed that the necessary land required for indoor stadium at

		<p>extending his support for the development of the village. He has informed that earlier in their village there are no proper roads and Chairman of the industry has sanctioned about Rs.2.0 Crores under M.P funds and special development package for laying of roads in their village. He has requested the Collector & District Magistrate, Kurnool District to allocate land in their village for the Construction of indoor stadium. He also informed that the villagers are facing water problem and requested the authorities to make immediate arrangement for solving the issue in their village. He also informed that they are welcoming the proposed expansion activity and requested the management to provide employment to the local villagers in the expansion project.</p>	<p>Panchalingala is acquired and for Gondiparla it is in process.</p> <p>The proponent informed that they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply.</p> <p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p>
3	Sri Prasad, Gondiparla Village	<p>He has contradicted with the chairman of the company regarding "95% of employment in the industry was provided to the local villagers" and informed that the industry is considering graduates having M.Sc. Chemistry and Engineering qualifications only for employment in the industry. He has requested the management to consider providing employment in the industry to local villagers who have completed the 10th Standard, ITI and others courses. He informed that the villagers are facing drinking water problem since many years and requested the chairman of the company for concrete steps for solving the issue as school children are also facing drinking water problem. He has requested the management for effective steps for</p>	<p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p> <p>The proponent informed that as their industry is a chemical industry. Persons having chemical engineering, MSc. Chemistry, B.Sc Chemistry qualification will have more opportunities in the industry rather than other people and suggested the villagers to pursue these courses which will be helpful for them to provide employment in the industry.</p>

		controlling air pollution as children is facing skin rashes due to pollution from the industry. He has also requested the industry to construct the compound wall for the school and requested the management to take up the expansion activity by providing employment opportunities to the surrounding villagers in the expansion project.	The proponent informed that they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements are made by laying pipe line from the company to the village for providing water supply.
4	Sri Ramesh Babu, Gondiparla Village	He has informed the gathering that the development of their village is being done by the management of the industry and he pleaded the management of the industry to develop their village further as the management is the only hope for them for the development of their village. He has welcomed the proposed expansion of the industry as it will impart developmental activities in the village, employment opportunities to the villagers and expressed his support for proposed expansion.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
5	Sri K. Venkata Swamy, MPTC, E.Tandrapadu Village	He has informed the gathering that he worked as a Sarpanch of E.Tandrapadu village for two terms and presently representing as MPTC for the E.Tandrapadu village. He informed that the Government is focusing on Industrialization apart from the Agriculture and encouraging the industrialization in the area by providing incentives. He informed that M/s. SRAAC Ltd., is operating the industry in the area since last 25 years and providing employment to the local people. The management of the industry apart from carrying out developmental activities in the surrounding villages is also supporting financial aid to the students for their education, sport activities as well as for the health	<p>The proponent informed that they have proposed to lay separate lines to panchalingala, E. Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements are made by laying pipe line from the company to the village for providing water supply.</p> <p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p>

		problems of the villagers. He has informed that the management of the industry have recently provided employment to the M.Sc, Engineering and others graduates of their village in the factory. He has informed that they are facing scarcity of water due to the larger size of their village and requested the management for improvement of water supply in the surrounding villagers. He also requested for providing employment opportunities for the local villagers in the expansion activity and extended his support for expansion as it will further improve the developmental activities in surrounding villages.	
6	Smt. Ananta Lakshmi, Sarpanch, Panchalingala Village	She has informed the gathering that many developmental activities are being carried out by the Chairman of the company in surrounding five villages. She informed that the industry is providing employment for the local people and also informed that the management has extended the support for improvement of drinking water supply, establishment of schools, construction of compound walls to the schools, providing furniture to the schools, establishing RO plants and health activities etc., in the surrounding villages. She has informed that they do not have any objection for the proposed expansion of the industry.	The proponent has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with Kurnool Municipal Corporation.
7	Sri. Satyanarayana Yadav, Ex. Director, Market Yard, E.Tandrapadu Village	He has informed that the industry is providing employment opportunities as well as water supply to the surrounding villages namely Panchalingala, Gondiparla, E.Tandrapadu, Pulathota, Doddipadu, Devamada etc.,. He has requested the management to further improve the water supply in the surrounding villages and requested to provide another 2 RO plants to meet the demand of RO water. He has requested the management to	<p>The proponent informed that they have established many RO plants in Kurnool District and management will provide RO plants in the surrounding villages also.</p> <p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p>

		consider providing employment opportunities to the local villagers in the expansion project and supported the expansion of the industry.	
8	Sri V.S.Naveen Kumar, "Praja Hakkula Committee Porata Samithi", E.Tandrapadu Village	He has appreciated the initiative of authorities for conducting public hearing before the expansion of the industry as it reflects the support of the villagers is very much essential for the development of the industry in the area. He has reiterated that E.Tandrapadu, Gondiparla and Panchalingala villages have extended their support to industry and requested the management of the industry to develop these villages by providing health and education facilities. He has also informed that apart from the development, the health and happiness of the individuals is also a vital and requested the management to extend free health services to these three villagers at Gowri Gopal hospital. He has requested management of the industry to improve the education facility in these villages as the students are facing problems for crossing Tungabhadra River daily and requested the management for their active support for construction of the bridge on Tungabhadra River at the earliest with the help of Government. He has informed that the earlier the industry is away from their village and is expanding their activities towards their village. He has requested the authorities to maintain statutory norms with regard to the minimum distance required from the factory to the nearby habitation and also requested authorities to take necessary steps as water pollution is being experienced by them during summer due to drawing of water from Tungabhadra river through tankers. He has requested the management to adopt	<p>The proponent has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process.</p> <p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent also assured that skill development programs are offered by their group and requested them to contact the group institution offering these courses.</p> <p>The proponent has informed that they are focusing to provide all necessary infrastructures in the surrounding villages on par with Kurnool Municipal Corporation. The proponent assured that they will pursue with government regarding additional bridge across Tungabhadra river.</p>

		these three villages and to provide toilets in each of the house hold of these three villages under "Swachh Bharath Programme". He has requested the management to provide skill development programme to the villagers and also to establish Chemical engineering course in any of the colleges in Kurnool district so that the surrounding villagers can avail and will be helpful for the employment opportunities in the industry. He has requested the management to provide priority to, the local villagers in employment opportunities. He has also requested to spend the CSR funds in the surrounding villagers for the developmental activities and extended his support for the proposed expansion activity.	
9	Sri Krishna Yadav Panchalingala Village	He welcomed the developmental activities being carried out by the chairman of the company in surrounding villages and requested the management to provide land of about 1.5 cents to the poor people who are not having any houses in the surrounding five villages with the help of Government and requested to provide necessary pattas to them. He has requested the management to provide employment for the local people, also to provide necessary medical assistance to the villagers in Gowri Gopal Hospital and he has extended his support for the proposed expansion of the industry.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
10	Sri Yerridasu, Ex-Sarpanch, Gondiparla Village	He has informed that bore water in their village is being contaminated and requested water supply to the surrounding villages as it is not suitable for drinking purpose. He has requested the management to provide at least 30% of the employment opportunities to the local villagers. He has requested the authorities to provide proper drainage facilities	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent informed that they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of

		for the Indiramma colony. He has informed that they are not against the proposed expansion activity and requested the management to provide employment to local villagers and also to provide water supply to the villages.	Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply.
11	Sri Jagan Mohan, Gondiparla Village	He has supported the proposal of the management for expansion of the industry and requested the management to provide employment opportunities to the local villagers. He has requested the management to provide drinking water supply either from Kurnool Municipal Corporation or from Panchalingala scheme as the Tungabhadra river water is being contaminated due to discharge of Sewage by the Municipal Corporation. He has requested the management to provide 02 No's of over head tanks in their village to meet the requirements of present population. He further requested the Collector & District Magistrate, Kurnool District to clear the hurdles for construction of bridge over Tungabhadra River connecting Gondiparla to Kurnool at the earliest and requested assurance from the management with regard to the providing of employment opportunities to the local villagers in the expansion project.	<p>The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.</p> <p>The proponent informed that they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply.</p>
12	Sri Rama Naidu, Ex-Surpanch, Panchalingala Village	He has informed the gathering that the surrounding five villages are being developed after the inception of the factory and the management of the industry have helped for providing infrastructure facilities such as Roads, High schools & water supply in the surrounding villages. He also informed that many people from the surrounding villages have obtained employment in the industry and he has extended his support to the expansion project as it will further	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.

		provide employment to the villagers.	
13	Sri Raju, Gondiparla Village	He has informed the gathering that all issues pertaining to their village have been raised by the villagers during the hearing and he has requested the management to establish English Medium School in the area and also to provide free education to girls till the intermediate level.	The proponent has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiates the process.
14	Sri. Bhaskar Reddy, "Rytu Sangam Secretary", Panchalingala Village	He informed the gathering that the management of the industry has provided allowance to the villagers who are Non-smoking and Non-alcoholic with a motive of promoting good habits for the villagers and informed that this has given a good result in the village. He requested the Collector & District Magistrate, Kurnool District for construction of Check Dam cum bridge over the Tungabhadra River so that sufficient water will be available for drinking even in summer. He has informed that the chairman of the industry with the help of Mr. K. Suryaprakash Reddy, Ex-Railway Minister has proposed for establishing railway coach factory near pachalingala village and requested him to pursue with the Government of India for providing employment to the local villagers and farmers who have given their land to the railway coach factory. He has requested the management of the industry to provide employment to the local villagers in the expansion activity and extended his support to the expansion of the industry.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
15	Sri Lakshminarayana, Gondiparla Village	He has informed the gathering that the surrounding villages are being developed due to establishing M/s. SRAAC Ltd., in the area and expressed his support for the proposed expansion activity.	The proponent assured that they will implement all pollution control measures and ensure least impact on the surroundings .
16	Sri Kiran Kumar, E.Tandrapadu Village	He has expressed the support for expansion of the industry and requested the management to provide	The proponent assured that management will provide employment to the local villagers in the

		employment to all the eligible persons in the surrounding villages based on their qualification and eligibility rather than the recommendation /influences. He requested the management to consider all the issues raised by the villagers during the hearing and also requested the management to further develop the surrounding villages by adopting them. He has informed the gathering that the industry has to develop the green belt on the eve of World Environmental Day and requested the industry to improve the green belt and to protect the environment in the surrounding area.	expansion activity based on qualification and skill levels. The proponent has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with the Kurnool Municipal Corporation.
17	Sri Rajendra Babu, E.Tandrapadu Village	He has explained his experience with regard to the financial aid being supported by the chairman of the company for survival of his grandson from severe health problem and he has extended his support for the expansion activity as many people will be extended with such medical facilities/aid by the management of the industry with the growth of the industry.	The proponent has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with Kurnool Municipal Corporation.
18	Smt. Hussanamma, Surpanch, Devamada Village	She has informed that they don't have proper roads & drainage facilities in their village earlier and informed that the Chairman of company have supported them for development of the road from Devamada to Kurnool. She has also informed that with the support of the chairman of the company' the Government has released funds for development of roads and drainage facilities in the Devamada village and requested the management of the industry for providing RO plant for Devamada village. She has envisaged that the proposed expansion activity will provide employment opportunities to their villagers and extended with a request to provide jobs even for 10 th standard people in their village. She has	The proponent has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with Kurnool Municipal Corporation. The proponent informed that they have established many RO plants in Kurnool District and management will provide RO plants in the surrounding villages also. The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels and informed that as their industry

		expressed her support for the proposed expansion of the industry.	was a chemical industry persons having chemical engineering, MSc. Chemistry, B.Sc Chemistry qualification would have more opportunities in the industry rather than other people and suggested the villagers to pursue these courses which will be helpful for them to provide employment in the industry.
19	Sri. Chenna Kesava Reddy, NGO, Hyderabad	He welcomed the proposed expansion project as it will provide employment to the local villagers and requested the authorities to recommend to MoEF&CC, Govt., of India for sanction of the permissions to the expansion. He has suggested the management to (i) impart training and skill development programmes for the unemployed people in the surrounding villages (ii) to spend the allocated funds under CSR activity for the development of the local village rather than spending in far away villages (iii) construction of Rain water harvesting structures in the area for pecculation of rain water and (iv) also to improve the Green belt to 50% of their area instead of 33% as it is a chemical unit and requested to recommend to MoEF&CC, Government of India for sanction of the permissions to the expansion activity.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent has informed that they are focusing to provide all necessary infrastructures in the surrounding villages on par with Kurnool Municipal Corporation, and that skill development programs are already offered to local villagers by the group institution at Kurnool.

Table 13.2 Response to Public Representations

S. No	Represented by	Representation	Proponent's Response
1	Sri T. Jaya Ramudu President, YSR Congress Party, E.Tandrapadu Village	He requested employment opportunities for the local villagers, adoption of E. Tandrapadu village and also establishing RO plant in the village by the management.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent assured to established RO plants in the surrounding villages also.
2	Sri S.Somanna, CPM Divisional Secretary, Kodumuru & Others	They requested employment to the local villagers up to 30%, providing protected drinking water supply to the surrounding villages and also for controlling pollution from the industry.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent assured to established RO plants in the surrounding villages also.
3	Sri. K Lakshmi Narayana & Others, Gondiparla village	They extended their support for the expansion activity.	
4	Sri. S fakruth, E.Tandrapadu village	He advised the industry to provide jobs and also to purchase their land as the crops are not growing due to the factory.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
5	Sri.S.Khaja Hussain, E.Tandrapadu village	He advised the industry to provide jobs and also to purchase their land as the crops are not growing due to the factory.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
6	Sri H. Madhubabu President, Rural Environmental Health Education Society, Hyderabad	He supported the proposed expansion activity and also suggested few measures to management for the expansion activity.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
7	Meetha Swachandha Seva Society,	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the	The proponent informed that they have proposed to lay separate lines to

	Abudullah Khan Estate, Kurnool	improvement of plantation in the area, providing drinking water, health & welfare of the employees, utilize the CSR funds for the development of surrounding villages.	panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply. The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
8	Sri.P. Krishnaiah, Pariyavarana Parirakshana Samiti (NGO), Hyderabad	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested to control the pollution as per the norms of Pollution Control Board and to provide employment opportunities to the local villages.	The proponent assured to implement the best of pollution control measures to ensure least impact on the surrounding villages.
9	Sri.T.Parushuram & Others Kashapuram village, Telangana State	They extended the support for the expansion activity.	
10	Sri.T.Raghavendra E.Tandrapadu & Others	He requested financial assistance from the management due to leg fracture occurred while he was working in the factory.	
11	Sri. Phani Raju	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity.	The proponent assured to implement pollution control measures to ensure least impact on surrounding villages.
12	Sri Kodanda Venkataramana, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment to the local villages.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
13	Sri A. Jammanna, Gondiparla village	He extended his support for the expansion and suggested to provide employment to the local	The proponent assured that management will provide employment to the local

		villages, to develop plantation and to carry out CSR activities in the surrounding villages.	villagers in the expansion activity based on qualification and skill levels. The proponent has informed that they are focusing to provide all necessary infrastructures in the surrounding villages on par with Kurnool Municipal Corporation.
14	Sri S. Sudhakar, Santosh Nagar, Kurnool	He extended his support for the expansion and suggested to provide employment to the local villages, and to carry out CSR activities in the surrounding villages.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent has informed that they are focusing to provide all necessary infrastructures in the surrounding villages on par with Kurnool Municipal Corporation.
15	Sri K. Nagaraj, Alampur village, Telangana State	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity.	
16	Sri G.Veeranna Shetty, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity.	
17	Sri K.Rama Krishna, Kasapuram Village, Alampur, Telangana State	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity.	
18	Sri KP Ravi Prakash Kasapuram Village, Alampur, Telangana State	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity.	
19	Sri D.Venkateshawara Reddy, Poolathota village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment opportunities, and also will develop the surrounding village.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
20	Sri. G.Jaghan Mohan,	He requested to recommend to MoEF&CC, GoI for	The proponent assured that management

	Gondiparla village	issue of Environmental Clearance for expansion activity as it will provide employment opportunities in the surrounding village.	will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
21	Sri. S.K.Noor Ahmed, Alampur, Telangana State	He extended his support for the expansion activity as it will provide employment opportunities, to the local villages.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
22	Sri.Lakshman, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment opportunities to the local village.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
23	Sri. Surya Chandra Reddy, Poolathota village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to provide employment to the local villages, develop the surrounding villages and also to protect the environment in the area.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels.
24	Sri. T. Madhu, E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance.	
25	Sri. R Raja Sekhar Reddy, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to provide employment to the local villages, develop the surrounding villages and also to protect the environment in the area.	The proponent assured that management will provide employment to the local villagers in the expansion activity based on qualification and skill levels. The proponent has informed that they are focusing to provide all necessary infrastructures in the surrounding villages on par with Kurnool Municipal Corporation.
26	Sri. A Chandra Sekhar	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance for expansion activity as there are no pollution & health problems to the villages to the industry.	The proponent assured that the Industry will follow the standards prescribed by Ministry of environment forests and climate change without causing any pollution problems to the surroundings area.
27	Sri. Ram Bhopal	He requested to recommend to MoEF&CC, GoI for	The proponent assured that the Industry

		issue of Environmental Clearance for expansion activity as there are no pollution & health problems to the villages to the industry.	will follow the standards prescribed by Ministry of environment forests and climate change without causing any pollution problems to the surroundings area.
28	Sri. A. Mattaiah (N.G.O), Hyderabad	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to adopt the surrounding villages, spend the CSR budget for providing education, health facilities & for protection of environment and also development of green belt.	The proponent assured to establish RO plants in the surrounding villages also. The proponent has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process.
29	Sri. K.Sreenivasulu, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
30	Sri. KK Reddy, Vikas Rural Development Society, Hyderabad	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to develop the surrounding the villages, for implementation of control measures for Air & Water pollution, providing employment to the local villages and utilization of CSR budget for education & health facilities and also for environmental protection in the area.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level. The proponent informed that they have established many RO plants in Kurnool District and management will provide RO plants in the surrounding villages also. The proponent has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process.
31	Sri J Sanjeev, President,	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the	The proponent has informed that they have constructed many schools in the area and

	Praja Telangana Journalist Welfare Association	management for utilization of CSR budget for education & health facilities and also for environmental protection in the area, to develop the green belt develop and improvement of Pollution Control Measures.	assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process. The proponent assured that the Industry will follow the standards prescribed by Ministry of environment forests and climate change without causing any pollution problems to the surroundings area.
32	Sri.P.Kiran Kumar Reddy (N.G.O)	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to adopt the surrounding villages, spend the CSR budget for providing education, health facilities & for protection of environment and also development of green belt.	The proponent informed that they have established many RO plants in the Kurnool District and management will provide RO plants in the surrounding villages also. The proponent has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process. The proponent assured that the Industry will follow the standards prescribed by Ministry of environment forests and climate change without causing any pollution problems to the surroundings area.
33	Sri.Shiva Prasad	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured to provide employment to locals based on qualification and skill levels.
34	Sri.B Narasimulu & Others, Gondiparla village	They extended the support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
35	Sri.Partha Saradi Reddy	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing

			employment in the expansion activity based on qualification and skill level.
36	Sri N Ramakrishnudu	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
37	Sri N.N Reddy	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
38	Sri K.Venkana	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
39	Sri.C.Krishana Murthy	He extended his support for expansion activity.	
40	Sri.K Venkateshwarlu, Jaharapuram village, Kurnool District	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
41	Sri.Kumar, E.Tandrapadu village	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
42	Sri Ramana Murthy Sharama	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
43	Sri.M Venkata Ramudu	He extended his support for expansion activity.	
44	Sri.Syed Jani Basha & Others	They extended their support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
45	Sri.R.Pratap,	He extended his support for expansion activity as it	The proponent assured that management

	Gargapuram, Kurnool District	will provide employment to the local villages.	will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
46	Sri. T. Jayanna, E.Tandrapadu village	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
47	Sri.N.V.V Satyanarayanulu	He extended his support for expansion activity.	
48	Sri.V.Venkata Ramana	extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
49	Sri.R.V.Ramanaih	He extended his support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
50	Sri B.Sai Baba	He requested the management to take him back into the service of the factory.	
51	Sri.M Bala Gangadhar Naidu, E.Tandrapadu village	He extended his support for expansion activity.	
52	Smt.P Uday Banu, Gondiparla village	She extended her support for expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
53	Sri. B Sekhar Babu, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management for the development of the surrounding villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
54	Sri G.V Krishan Kanth Reddy, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
55	Sri A. Uday Kumar	He extended his support for expansion activity as it	The proponent assured that management

		will provide employment to the local villages and also there are no pollution problems from the industry.	will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
56	Sri.K.V.V Prasad, Gondiparla village, Kurnool,	He extended his support for expansion activity.	
57	Sri. M Nagaraju, Gondiparla village	He extended his support for expansion activity as management provided education facilities, drinking water supply and employment opportunities to the local villages.	
58	Sri. Nagendra, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
59	Sri M Sekhar, E.Tandrapadu village	He extended his support for the expansion activity as there are no pollution problems from the industry and industry is providing employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
60	Sri Jaya Ramudu, E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
61	Sri K.Maheswara Rao	He extended his support for the expansion activity as it will provide employment.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
62	Sri Sureswara Reddy	He extended his support for the expansion activity.	
63	Sri C. Maddiletti, E.Tandrapadu	He extended his support for the expansion activity.	
64	Sri B.Guru Swami E.Tandrapadu	He extended his support for the expansion activity as it will provide employment to the villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
65	Sri B.Tulasi Ram,	He requested to recommend to MoEF&CC, GoI for	The proponent assured that management

	Gondiparla village	issue of Environmental Clearance as it will provide employment to the local villages.	will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
66	Sri BC Maddiletti, Gondiparla village	He extended his support for the expansion activity as it will provide employment to the villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
67	Sri Laal Swami	He extended his support for the expansion activity.	
68	Smt. Lakshmi, E.Tandrapadu village	She extended her support for the expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
69	Sri.S.Jammana, E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
70	Sri.T.Sukanna E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
71	Sri V.Bheemesh E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
72	Sri B Giddiah & Others	They extended their support for the expansion activity as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
73	Sri G Rangaswamy, Doddipadu village	He extended his support for the expansion activity as it will provide employment to the local villages and also there are no pollution problems from the industry.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
74	Sri Hari Narayana	He requested to recommend to MoEF&CC, GoI for	

	E.Tandrapadu village	issue of Environmental Clearance.	
75	Sri T.Mahendra, E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance.	
76	Sri T.Chinna Shiva & Others, E.Tandrapadu village	They requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance.	
77	Sri T.Bala Raju, E.Tandrapadu village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance.	
78	Sri K.Venkateshwarlu, E.Tandrapadu village	He requested to take him on casual roles in the factory instead of through outsourcing agency.	
79	Sri M Raja Sekhar E.Tandrapadu village	He requested to provide employment opportunity to him in the industry.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
80	Sri M.Nagaraju MPTC, Gondiparla village and Smt L Hussainamma Sarpanch	They extended the support for expansion of the industry and suggested the management to provide employment opportunities to the local villages and to protect the environment.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
81	Sri K.Govind, Gondiparla village	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
82	Sri T.Srinivasulu, Gondiparla village	He extended his support to expansion activity as it will provide employment to the local villages and suggested the management for the development of village and also protection of the environment.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level. The proponent assured that the Industry will follow the standards prescribed by Ministry of environment forests and climate change without causing any pollution problems to the surroundings area.
83	Sri M.Nagaraju MPTC, Gondiparla village	He requested the authorities for allocation of land for construction of indoor stadium in the village.	The proponent has informed that the Indoor stadiums at Panchalingala, Gondiparla were sanctioned and also

			informed that the necessary land required for indoor stadium at Panchalingala is acquired and for Gondiparla is in process.
84	Smt K Lakshmi Devi Sarpanch Gondiparla village	He requested the authorities for allocation of 1.0 Acre of land for construction of indoor stadium in the village, and also allocation of 0.5 Acres of land for construction of compost yard in the village.	The proponent has informed that the Indoor stadiums at Panchalingala, Gondiparla were sanctioned and also informed that the necessary land required for indoor stadium at Panchalingala is acquired and for Gondiparla is in process.
85	Sri S.S.L Prasad & Others Gondiparla village	They requested the management for providing employment opportunities for local villagers for CMS plant -II, providing free education and employment opportunities for the women in the village, construction of houses for the poor people in the village & construction of hospitals in the village. He also requested for water supply to their village.	The proponent informed that they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured that till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply. The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
86	Sri Y.Chinna Kesava Reedy, Vanastahalipuram, Hyderabad	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management provide local employment, spend the CSR funds in the local villages, conduction medical camps, providing skill development programs to their villages.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level. The proponent has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with Kurnool Municipal Corporation.
87	Smt N.Anatha Lakshmi Sarpanch Panchalingala	She extended her support for expansion activity as it will develop their village.	The proponent has informed that they are focusing to provide all necessary

			infrastructure in the surrounding villages on par with Kurnool Municipal Corporation.
88	Sri K.Venkata Swamy MPTC -II, E.Tandrapadu,	He requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance and suggested the management to provide employment to local people.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
89	Sri M.Nagaraju MPTC, Zeheer & Others, Gondiparla village	They extended their support for expansion activity as it will provide employment opportunity to their village.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
90	Smt Lakshmiddevamma Surpanch, Govind & Others, Gondiparla village	They extended their support for expansion activity as, it will provide employment opportunity to their local village.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
91	Sri P Satyanarayana, E.Tandrapadu	He extended his support for expansion activity as it will provide employment opportunity to their local village.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
92	Sri Rajasekhar Reddy & Others, Gondiparla village	They requested to recommend to MoEF&CC, GoI for issue of Environmental Clearance as the proposed expansion will provide employment to the villagers and also will develop their village.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.
93	Sri B.Venkateshwarlu Ex.Surpanch, E.Tandrapadu	He extended their support for expansion activity as it will provide employment opportunity to their village.	The proponent assured that management will give preference to locals for providing employment in the expansion activity based on qualification and skill level.

MINUTES OF THE ENVIRONMENTAL PUBLIC HEARING OF M/S. SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED (M/s.SRAAC Ltd) FOR EXPANSION I.E., FOR INCREASING THE PRODUCTION CAPACITY OF THEIR EXISTING CHLOR - ALKALI, CHLOROMETHANES AND ALSO FOR CHLORODIFLUOROMETHANE PLANT IN THEIR EXISTING PREMISES I.E., AT SY.NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1 ETC., GONDIPARLA (V), KURNOOL (M), KURNOOL DISTRICT., HELD ON 29.11.2017 AT 11.00 A.M NEAR THE EXISTING UNIT PREMISES I.E., IN THE OPEN AREA OPPOSITE TO THE MAIN GATE OF M/S. SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED (SRAACL), GONDIPARLA (V), KURNOOL (M), KURNOOL DISTRICT, ANDHRA PRADESH

A. THE FOLLOWING PANEL MEMBERS ATTENDED THE ENVIRONMENTAL PUBLIC HEARING PROCESS.

- | | |
|-------------------------------------|----------|
| 1. Sri S. Satyanarayana.,I.A.S | Chairman |
| The Collector & District Magistrate | |
| Kurnool District. | |
| 2. Sri P.Prasada Rao, | Member |
| Environmental Engineer, | |
| A.P.Pollution Control Board, | |
| Regional Office, Kurnool. | |

B. REPRESENTATIVES OF THE INDUSTRY

- | | |
|---------------------------|---------------------------------------------------------------------------------------|
| 1. Sri. T.G. Venkatesh, | Chairman & Managing Director
of M/s.SRAAC Ltd., |
| 2. Sri N. Jeswanth Reddy, | Executive Director (Technical) of
of M/s.SRAAC Ltd., |
| 3. Sri G.V. Reddy, | Environmental Consultant,
M/s. Teams Labs and Consultants,
Ameerpet, Hyderabad. |

The list of Officers and Public present at the meeting is appended as Annexure-A.

At the outset the Environmental Engineer, A.P. Pollution Control Board, Regional Office, Kurnool, welcomed the Collector & District Magistrate, Kurnool District, the Chairman of the Public Hearing meeting, the public gathered at the venue, Media, NGO's and also the District Officials. The Environmental Engineer informed the gathering that the

P. Prasad Rao

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) is in operation in the area more than a decade and they have proposed for the expansion of their unit in their existing premises at Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, etc., Gondiparla (V), Kurnool (M), Kurnool District, Andhra Pradesh with an additional investment of Rs.360 Crores.

He explained the salient features of the notification No. S.O.No.1533, dated 14.09.2006 & its subsequent amendments issued by the Ministry of Environment, Forests & Climate change, Govt. of India (MoEF & CC, GoI) under the Environment (Protection) Act, 1986. He stated that projects listed in the Schedule of EIA Notification No. S.O.No.1533, dated 14.09.2006 are required to obtain the environmental clearance under the provisions of Environment Protection Act, 1986. He also informed that the proposed expansion of M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) for expansion i.e., for increasing the production capacity of Chloro^o Alkali, Chloromethanes plants and for Chlorodifluoromethane Plant requires Environmental Clearance from the MoEF&CC, Govt. of India and Environmental Public Hearing is mandatory for this expansion project.

He informed that a press notification pertaining to the proposed public hearing was published in “ **Andhra Jyothi** ” and “ **The New Indian Express** ” daily newspapers on 28.10.2017 and also the draft EIA / EMP report, executive summaries in Telugu and English were displayed at i) Office of the Collector & District Magistrate, Kurnool ii) Office of the Chief Executive Officer, Zilla Parishad Office, Kurnool (iii) Office of the General Manager, District Industries Centre, Kurnool iv) Office of the MoEF & CC, GoI, Regional Office (South Eastern Zone), Chennai v) APPCB, Zonal Office, Kurnool vi) APPCB, Regional Office, Kurnool, vii) Office of the Sub-Collector, Kurnool, viii) Tahsildhar Office, Kurnool (M), Kurnool District ix) Gram Panchayat Office, Gondiparla (V), Kurnool (M), Kurnool District for information of the public to offer Suggestions, Views, Comments and objections, if any within 30 days from the date of publication. He said that, an opportunity will be given to the public attended for the public hearing to express their views, suggestions, comments and objections if any on the proposed project. He informed that the Audio & Video of proceedings of the public Hearing will be recorded and the minutes will be communicated to MoEF & CC, Govt., of India for examination of the proposal while issuing Environmental Clearance. He then requested the Collector & District Magistrate, Chairman of the public hearing panel to conduct the proceedings of the meeting.

The Collector & District Magistrate, Kurnool District: Welcomed the Villagers, Farmers, Press & Media, Management of industry and other District Officials to the public hearing. He informed the gathering that M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) was established in the year 1957 and at present they have proposed expansion activity in their existing premises with additional investment of Rs.360 Crores. He informed that the present public hearing is arranged for obtaining the views, objections, suggestion etc., if any of the villagers on the proposed expansion activity. He also informed that the proposed expansion activity will provide employment to about 350 members and informed that the industry has allocated about Rs. 8.20 Crores for the Pollution Control facilities. He also informed that the industry has developed green belt over an extent of about 100 acres and has planted about 80,000 saplings during last three years. He also informed the gathering that the industry is spending about Rs.70 Lakhs per year towards green belt development and also about Rs.50 lakhs towards CSR activities in the nearby villages. He informed that the public hearing is arranged to inform the public the environmental impacts and its adverse climate changes in the area due to proposed expansion activity, mitigation & safety measures proposed by the management and also to obtain the opinion of the villagers on the proposed expansion activity. He has assured the gathering the objections raised by them will be noted down and will be submitted to the MoE&F, Govt. of India for consideration while issuing permission to the expansion activity. The Collector & District Magistrate has requested the management to briefly explain the salient features of the proposed expansion activity. He also requested the technical consultant to briefly explain the environmental impacts of the proposed expansion on the surroundings and mitigation measures proposed to be adopted by them to the public gathered at the venue.

Sri. T.G. Venkatesh, Chairman of the M/s.SRAACL: welcomed the Collector & District Magistrate, Kurnool District, Revenue Divisional Officer, Kurnool, Villagers, Farmers, Media, NGO's, Police and the Public gathered at the venue. He informed that they are proposing to expand the production capacities of caustic soda, potassium hydroxide by another 500 TPD, Chlorine gas by another 300 TPD and other downstream products within the existing premises with an additional investment of Rs.360 Crores. He informed that they will provide employment to about 350 persons in phased manner in the expansion activity and local villagers will be given priority in the employment opportunities in the expansion activity. He further informed that the industry has allocated about Rs.8.2 Crores towards establishing Pollution Control facilities, spending about Rs.75 lakhs per annum towards

P. Prasadulu

greenbelt development and about Rs. 50 lakhs per annum towards CSR activities for the development of the nearby villages.

He informed that prior to the establishment of their industry in the area, the nearby villages are not having basic infrastructure facilities like Roads, Schools, drinking water, Hospitals etc.,. He informed that that the nearby villages are being developed after establishment of the their industry and the surrounding villages have been provided with basic amenities such as roads, drinking water facilities, & education facilities etc., with the aid of Government. During the inception of the industry, the experience and technical persons all over the country were recruited as the technology was new and informed the gathering local persons will be provided employment in the industry based on their qualification as and when vacancies arises. He informed the gathering that about 95% of the employment opportunities in the industry were given to the people belonging to the area and requested the villagers to support their expansion activity. He has informed the gathering that their environmental consultant will briefly explain the technical details of their proposed expansion, environmental impact study, steps proposed by them to abate the Pollution from the expansion activity. He has assured the gathering that he will continue to focus on the development of the nearby villages as an entrepreneur as well as public representative and requested the surrounding villagers to extend their support to the industry for expansion activity. He has also requested the public gathered at the venue to express their views, objections, suggestion etc., on the proposed expansion project.

Sri. G.Venugopala Reddy, Environmental Consultant, Teams labs, Hyderabad Welcomed the panel members, public attended for the public hearing, NGO's and informed the gathering that M/s SRAAC Ltd., has proposed expansion of their Chloro Alkali, Chloromethanes division and also proposed to establish Chlorodifluoromethane Plant within the existing premises of 152.0 Ha with an additional investment of about Rs.360 Crores. He also informed that pre-feasibility report was submitted to MoEF & CC, Govt. of India for the proposed expansion and informed that 'Terms of Reference' was issued by MoEF&CC, GoI, for the proposed expansion activity vide order dt. 21-06-2016. Also, MoEF&CC, GoI, in the 'Terms of Reference' directed the industry to obtain the public views, suggestions etc., if any on the proposed expansion along with EIA/EMP report for consideration of the proposal for expansion. He explained about salient features of the technology adopted by the management of the industry and informed that M/s. SRAAC Ltd., is a first of its kind industry in India implementing Bi-Polar Membrane Technology in the year 1987. He informed that the technology is high energy efficient and no hazardous inputs are being used in the process

unlike in Mercury and Asbestos technology. He also informed that the industry since its inception implemented many novel technologies such as recovery of Barium Sulphate from Brine sludge, installation of closed system for chlorine storage facilities, establishing chlorine utilization units in and around parent plant, Zero Liquid discharge from chloro alkali unit etc., He informed that the manufacturing of Caustic Soda/Potassium Hydroxide is through by electrolysis process where salt solution, pure water are electrolysed using direct current. The end product of the electrolysed products are Chlorine Gas, Hydrogen Gas, Caustic Soda/Potassium Hydroxide. All the products produced from the electrolysis process are further processed in the various stages to get end products as per the requirement of market. The main products Caustic Soda/Potassium hydroxide are having high demand and other product like chlorine is having difficulty of selling as there is no much market for the chlorine. Considering this difficulty, the industry has established chlorine utilization units adjacent to the main plant, there by transportation to long distances and selling of chlorine is taken care from the inception of the industry. Apart from establishing Chlorine derivative units, the industry has also established Chloromethane plant to produce Methylchloride, Methylene Dichloride, Chloroform and Carbon Tetra Chloride since, 2016 to consume about 140 TPD chlorine produced in the Chloro Alkali division. He informed that the industry has proposed to expand the Chloromethane unit also in the expansion activity to utilize the Chlorine generated in the proposed expansion of Chloro Alkali division. The industry is planning to manufacture a new product namely Chlorodifluoromethane (10 TPD) to utilize Chloroform produced in the Chloromethanes section. He informed that the power requirement for the Chloro alkali unit is very high, as it is a electrolysis process and the required power for electrolysis is partly obtained from the grid and also from their in house 76 MW coal based thermal power plant. The industry has provided dust extraction system for coal handling, provided Air Pollution Control Equipment i.e., ESP for controlling flue gas emissions from the boiler and to meet the emission norms prescribed by the AP Pollution control Board. He informed that the other sources of Air Pollution from the industry are HCL gas from HCL unit, Chlorine from Hypo plant and storage tank and informed that they will be installing water scrubbers for Hcl plant, caustic scrubbers at Hypo plant and Chlorine storage to mitigate the emissions. He informed the gathering M/s. SRAAC Ltd., is the first company of its kind in the country to provide closed Chlorine storage and the closed system is being connected to scrubber. The other sources of pollution from the industry is waste water which contains mainly Chlorine and does not contain any other toxic chemicals. The industry has established full fledged effluent treatment plant including Reverse Osmosis unit for the

P. J. Vasanthakumari

treatment and re use of waste water. He informed that existing ETP will be further upgraded for the expansion activity to meet the prescribed norms stipulated by the Board. He informed that other source of pollution from the industry is solid waste generated from power plant and Brine plant. The fly ash generated from the power plant is sold to brick manufacturing units and the industry is recovering the barium sulphate, sodium sulphate from the brine sludge there by reducing about 70% of solid waste generation. The balance brine sludge containing calcium carbonate, magnesium hydroxide and sand is being disposed to their onsite secured land fill. The other wastes like used batteries, used oils, used sulphuric acid will be sold to authorised recyclers as per the guide lines. He informed that the proposed expansion will provide employment directly to about 350 people and also will provide indirect employment to about 500 people. He assured the gathering that development activities will be carried out in the surrounding villages by the management with the help of CSR funds. He has informed the gathering that the industry has developed green belt of about 100 acres during last 3 years and will continue to improve the green belt area in the surroundings.

Views, Suggestions & Objections raised by the Public:

Sri K. Somanna, Ex-Sarpanch, Gondiparla (V): He informed the gathering that earlier he was Sarpanch for the Gondiparla village for about 18 years and informed that at present his wife is a sarpanch for the Gondiparla village. He informed that after inception of the industry in their village the basic amenities such as roads, drainage facilities, and drinking water facilities have been improved. He also informed that the management has provided drinking water facility in their village by installing 2 No's of drinking water RO plants and also extended their support for establishing another 2 No's of RO plants in their village through Panchayatraj funds. He informed that, recently the chairman of the industry through Govt have sanctioned about Rs. 2.0 Crores for the development of roads and also about Rs. 50 lakhs for developing indoor stadium in the village. He requested the Collector & District Magistrate, Kurnool District to provide required land for developing indoor stadium. He informed that the chairman of the company is developing their village by providing irrigation facilities, providing employment to their villagers. He has informed that they are welcoming the proposed expansion activity on behalf of their village and requested the management to give priority to their villagers in the employment opportunities in the expansion project.

Sri M. Nagaraj, MPTC, Gondiparla (V): He informed that since inception of the industry in their village the industry has developed their village by providing roads, drainage facilities,

etc., and informed that the Chairman of the Company is extending his support for the development of the village. He has informed that earlier in their village there are no proper roads and Chairman of the industry has sanctioned about Rs.2.0 Crores under M.P funds and special development package for laying of roads in their village. He has requested the Collector & District Magistrate, Kurnool District to allocate land in their village for the Construction of indoor stadium. He also informed that the villagers are facing water problem and requested the authorities to make immediate arrangement for solving the issue in their village. He also informed that they are welcoming the proposed expansion activity and requested the management to provide employment to the local villagers in the expansion project.

Sri Prasad, Gondiparla (V): He has contradicted with the chairman of the company regarding "95% of employment in the industry was provided to the local villagers" and informed that the industry is considering graduates having M.Sc. Chemistry and Engineering qualifications only for employment in the industry. He has requested the management to consider providing employment in the industry to local villagers who have completed the 10th Standard, ITI and others courses. He informed that the villagers are facing drinking water problem since many years and requested the chairman of the company for concrete steps for solving the issue as school children are also facing drinking water problem. He has requested the management for effective steps for controlling air pollution as children are facing skin rashes due to pollution from the industry. He has also requested the industry to construct the compound wall for the school and requested the management to take up the expansion activity by providing employment opportunities to the surrounding villagers in the expansion project.

Sri Ramesh Babu, Gondiparla (V): He has informed the gathering that the development of their village is being done by the management of the industry and he pleaded the management of the industry to develop their village further as the management is the only hope for them for the development of their village. He has welcomed the proposed expansion of the industry as it will impart developmental activities in the village, employment opportunities to the villagers and expressed his support for proposed expansion.

Sri K. Venkata Swamy, MPTC, E.Tandrapadu(V): He has informed the gathering that he worked as a Sarpanch of E.Tandrapadu village for two terms and presently representing as MPTC for the E.Tandrapadu village. He informed that the Government is focusing on Industrialization apart from the Agriculture and encouraging the industrialization in the area by providing incentives. He informed that M/s.SRAAC Ltd., is operating the industry in the

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area since last 25 years and providing employment to the local people. The management of the industry apart from carrying out developmental activities in the surrounding villages is also supporting financial aid to the students for their education, sport activities as well as for the health problems of the villagers. He has informed that the management of the industry have recently provided employment to the MSc., Engineering and others graduates of their village in the factory. He has informed that they are facing scarcity of water due to the larger size of their village and requested the management for improvement of water supply in the surrounding villagers. He also requested for providing employment opportunities for the local villagers in the expansion activity and extended his support for the expansion as it will further improve the developmental activities in surrounding villages.

Smt. Ananta Lakshmi, Sarpanch, Panchalingala (V): She has informed the gathering that many developmental activities are being carried out by the Chairman of the company in surrounding five villages. She informed that the industry is providing employment for the local people and also informed that the management has extended the support for improvement of drinking water supply, establishment of schools, construction of compound walls to the schools, providing furniture to the schools, establishing RO plants and health activities etc., in the surrounding villages. She has informed that they do not have any objection for the proposed expansion of the industry.

Sri. Satyanarayana Yadav, Ex. Director, Market Yard, E.Tandrapadu (V): He has informed that the industry is providing employment opportunities as well as water supply to the surrounding villages namely Panchalingala, Gondiparla, E.Tandrapadu, Pulathota, Doddipadu, Devamada etc.,. He has requested the management to further improve the water supply in the surrounding villages and requested to provide another 2 RO plants to meet the demand of RO water. He has requested the management to consider providing employment opportunities to the local villagers in the expansion project and supported the expansion of the industry.

Sri V.S.Naveen Kumar, "Praja Hakkula Committee Porata Samithi", E.Tandrapadu (V): He has appreciated the initiative of authorities for conducting public hearing before the expansion of the industry as it reflects the support of the villagers is very much essential for the development of the industry in the area. He has reiterated that E.Tandrapadu, Gondiparla and Panchalingala villages have extended their support to industry and requested the management of the industry to develop these villages by providing health and education facilities. He has also informed that apart from the development, the health and happiness of the individuals is also a vital and requested the management to extend free health services to

these three villagers at Gowri Gopal hospital. He has requested management of the industry to improve the education facility in these villages as the students are facing problems for crossing Tungabhadra River daily and requested the management for their active support for construction of the bridge on Tungabhadra River at the earliest with the help of Government. He has informed that the earlier the industry is away from their village and is expanding their activities towards their village. He has requested the authorities to maintain statutory norms with regard to the minimum distance required from the factory to the nearby habitation and also requested authorities to take necessary steps as water pollution is being experienced by them during summer due to drawing of water from Tungabhadra river through tankers. He has requested the management to adopt these three villages and to provide toilets in each of the house hold of these three villages under "Swachh Bharath Programme". He has requested the management to provide skill development programme to the villagers and also to establish Chemical engineering course in any of the colleges in Kurnool district so that the surrounding villagers can avail and will be helpful for the employment opportunities in the industry. He has requested the management to provide priority to the local villagers in employment opportunities. He has also requested to spend the CSR funds in the surrounding villagers for the developmental activities and extended his support for the proposed expansion activity.

Sri Krishna Yadav Panchalingala (V): He welcomed the developmental activities being carried out by the chairman of the company in surrounding villages and requested the management to provide land of about 1.5 cents to the poor people who are not having any houses in the surrounding five villages with the help of Government and requested to provide necessary pattas to them. He has requested the management to provide employment for the local people, also to provide necessary medical assistance to the villagers in Gowri Gopal Hospital and he has extended his support for the proposed expansion of the industry.

Sri Yerridasu, Ex-Sarpanch, Gondiparla (V): He has informed that bore water in their village is being contaminated and requested water supply to the surrounding villages as it is not suitable for drinking purpose. He has requested the management to provide atleast 30% of the employment opportunities to the local villagers. He has requested the authorities to provide proper drainage facilities for the Indiramma colony. He has informed that they are not against the proposed expansion activity and requested the management to provide employment to local villagers and also to provide water supply to the villages.

Sri Jagan Mohan, Gondiparla (V): He has supported the proposal of the management for expansion of the industry and requested the management to provide employment

P. Prasadulu

opportunities to the local villagers. He has requested the management to provide drinking water supply either from Kurnool Municipal Corporation or from Panchalingala scheme as the Tungabhadra river water is being contaminated due to discharge of Sewage by the Municipal Corporation. He has requested the management to provide 02 No's of over head tanks in their village to meet the requirements of present population. He further requested the Collector & District Magistrate, Kurnool District to clear the hurdles for construction of bridge over Tungabhadra River connecting Gondiparla to Kurnool at the earliest and requested assurance from the management with regard to the providing of employment opportunities to the local villagers in the expansion project.

Sri Rama Naidu, Ex-Surpanch, Panchalingala (V): He has informed the gathering that the surrounding five villages are being developed after the inception of the factory and the management of the industry have helped for providing infrastructure facilities such as Roads, High schools & water supply in the surrounding villages. He also informed that many people from the surrounding villages have obtained employment in the industry and he has extended his support to the expansion project as it will further provide employment to the villagers.

Sri Raju, Gondiparla(V): He has informed the gathering that all issues pertaining to their village have been raised by the villagers during the hearing and he has requested the management to establish English Medium School in the area and also to provide free education to girls till the intermediate level.

Sri. Bhaskar Reddy, "Rytu Sangam Secretary", Panchalingala (V): He informed the gathering that the management of the industry has provided allowance to the villagers who are Non-smoking and Non-alcoholic with a motive of promoting good habits for the villagers and informed that this has given a good result in the village. He requested the Collector & District Magistrate, Kurnool District for construction of Check Dam cum bridge over the Tungabhadra River so that sufficient water will be available for drinking even in summer. He has informed that the chairman of the industry with the help of Mr. K. Suryaprakash Reddy, Ex-Railway Minister has proposed for establishing railway coach factory near pachalingala village and requested him to pursue with the Government of India for providing employment to the local villagers and farmers who have given their land to the railway coach factory. He has requested the management of the industry to provide employment to the local villagers in the expansion activity and extended his support to the expansion of the industry.

Sri Lakshminarayana, Gondiparla (V): He has informed the gathering that the surrounding villages are being developed due to establishing M/s.SRAAC Ltd., in the area and expressed his support for the proposed expansion activity.

Sri Kiran Kumar, E.Tandrapadu (V): He has expressed the support for expansion of the industry and requested the management to provide employment to all the eligible persons in the surrounding villages based on their qualification and eligibility rather than the recommendation/influences. He requested the management to consider all the issues raised by the villagers during the hearing and also requested the management to further develop the surrounding villages by adopting them. He has informed the gathering that the industry has to develop the green belt on the eve of World Environmental Day and requested the industry to improve the green belt and to protect the environment in the surrounding area.

Sri Rajendra Babu, E.Tandrapadu (V): He has explained his experience with regard to the financial aid being supported by the chairman of the company for survival of his grandson from severe health problem and he has extended his support for the expansion activity as many people will be extended with such medical facilities/aid by the management of the industry with the growth of the industry.

Smt. Hussanamma, Surpanch, Devamada (V): She has informed that they don't have proper roads & drainage facilities in their village earlier and informed that the Chairman of company have supported them for development of the road from Devamada to Kurnool. She has also informed that with the support of the chairman of the company the Government has released funds for development of roads and drainage facilities in the Devamada village and requested the management of the industry for providing RO plant for Devamada village. She has envisaged that the proposed expansion activity will provide employment opportunities to their villagers and extended with a request to provide jobs even for 10th standard people in their village. She has expressed her support for the proposed expansion of the industry.

Sri. Chenna Kesava Reddy, NGO, Hyderabad: He welcomed the proposed expansion project as it will provide employment to the local villagers and requested the authorities to recommend to MoEF&CC, Govt., of India for sanction of the permissions to the expansion. He has suggested the management to (i) impart training and skill development programmes for the unemployed people in the surrounding villages (ii) to spend the allocated funds under CSR activity for the development of the local village rather than spending in far away villages (iii) construction of Rain water harvesting structures in the area for percolation of rain water and (iv) also to improve the Green belt to 50% of their area instead of 33% as it is a chemical unit and requested to recommend to MoEF&CC, Government of India for sanction of the permissions to the expansion activity.

P. Prasadulu

Response from Management for the issues raised by the public:

Sri T.G.Venkatesh Chairman of Company: He assured the gathering that management will give outmost preference for providing employment to the local villagers in the expansion activity. He informed that as their industry is a chemical industry persons having chemical engineering, MSc. Chemistry, B.Sc Chemistry qualification will have more opportunities in the industry rather than other people and suggested the villagers to peruse these courses which will be helpful for them to provide employment in the industry. With regard to the issue raised by the villagers regarding water supply to Gondiparla village, he informed that they could not pump the water to the surrounding villages from Tungabhadra river as it is being contaminated due to discharge of sewage by Kurnool Municipal Corporation. He informed that the present scheme established at panchalingala village could not provide water to downstream village like Gondiparla village as the most of the water is being used by E.Tandrapadu villages and is not reaching the Gondiparla village. Considering this difficulty, they have proposed to lay separate lines to panchalingala, E.Tandrapadu, Gondiparla with the help of Government which will completely resolve the water supply issue in the surrounding villages. He assured the gathering till the completion of the scheme, alternative arrangements were made by laying pipe line from the company to the village for providing water supply. He also informed that they have established many RO plants in the Kurnool District and management will provide RO plants in the surrounding villages also. He has informed that they have constructed many schools in the area and assured that necessary help will be extended from the management to establish College till intermediate level in the area as and when Government initiate the process. He has informed that the Indoor stadiums at Panchalingala, Gondiparla were sanctioned and also informed that the necessary land required for indoor stadium at Panchalingala is acquired and for Gondiparla is in process. He has informed that they are focusing to provide all necessary infrastructure in the surrounding villages on par with the Kurnool Municipal Corporation and thanked the villagers for attending the Public hearing of expansion activity.

Sri S.Satyanarayana.,I.A.S, District Collector & District Magistrate, Kurnool District:

He informed that the Government is giving priority to the industrialization and thanked the public for attending the environmental public hearing. He informed the gathering that about 18 persons from the village, an NGO have expressed their views and suggestions on the proposed expansion. He also informed that about 93 representations were received during public hearing and informed that the entire proceedings of the public hearing is video

recorded and issues raised along with the representation will be submitted to Ministry of Environment, Forest and Climate Change, Government of India for taking further necessary action.

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P. Prasadulu 29/11/17
Environmental Engineer,
Regional office, APPCB,
Kurnool.

MS 29/11/2017
Collector & District Magistrate,
Kurnool District

Enclosures:

- (i) C.D for the videography of the proceedings of the Public Hearing Meeting.
- (ii) 03 No's of Written representations received from (i) Sri H Madhubabu (Environment Volunteer) (ii) Sri I V. Sunanda Reddy President, "Dharithri Paryavarana Parirakshana Samstha", Nalgonda District, Telangana State (iii) Dr K Babu rao (Chief Scientist (Retd), Hyderabad.
- (iii) 93 No's of Written representations received from the villagers, NGO'S and others received during Public hearing are enclosed.

Annexure - I

List of representations received during the public hearing

Sl.No	Details of the of the Representation received from
1.	Representation received from Sri T. Jaya Ramudu President, YSR Congress Party, E.Tandrapadu Village requesting employment opportunities for the local villagers, adoption of E.Tandrapadu village and also establishing RO plant in the village by the management
2.	Representation received from Sri S.Somanna, CPM Divisional Secretary, Kodumuru & Others requesting employment to the local villagers up to 30%, providing protected drinking water supply to the surrounding villages and also for controlling pollution from the industry.
3.	Representation received from Sri. K Lakshmi Narayana & Others, Gondiparla village, extending their support for the expansion activity.
4.	Representation received from Sri. S fakruth, E.Tandrapadu village with request to advise to the industry to provide jobs and also to purchase their land as the crops are not growing due to the factory.
5.	Representation received from Sri.S.Khaja Hussain, E.Tandrapadu village with request to advise to the industry to provide jobs and also to purchase their land as the crops are not growing due to the factory.
6.	Representation received from Sri H. Madhubabu President Rural Environmental Health Education Society, Hyderabad supporting the proposed expansion activity and also suggested few measures to management for the expansion activity.
7.	Representation received from Meetha Swachandha Seva Society, Abudullah Khan Estate, Kurnool with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance. He has suggested the improvement of plantation in the area, providing drinking water, health & welfare of the employees, utilize the CSR funds for the development of surrounding villages
8.	Representation received from Sri.P. Krishnaiah, Pariyavarana Parirakshana Samiti (NGO), Hyderabad with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance. He has suggested to control the pollution as per the norms of Pollution Control Board and to provide employment opportunities to the local villages
9.	Representation received from Sri.T.Parushuram & Others Kashapuram village, Telangana State, extending the support for the expansion activity.
10.	Representation received from Sri.T.Raghavendra E.Tandrapadu & Others requesting financial assistance from the management due to leg fracture occurred while he was working in the factory.
11.	Representation received from Sri. Phani Raju with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity.
12.	Representation received from Sri Kodanda Venkataramana, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment to the local villages
13.	Representation received from Sri A. Jammanna, Gondiparla village extending his support for the expansion and suggested to provide employment to the local villages, to develop plantation and to carry out CSR activities in the surrounding villages.

Anex 1/6

14.	Representation received from Sri S. Sudhakar, Santosh Nagar, Kurnool extending his support for the expansion and suggested to provide employment to the local villages, and to carry out CSR activities in the surrounding villages.
15.	Representation received from Sri K. Nagaraj, Alampur village, Telangana State with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity.
16.	Representation received from Sri G.Veeranna Shetty, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity.
17.	Representation received from Sri K.Rama Krishna, Kasapuram Village, Alampur, Telangana State with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity.
18.	Representation received from Sri KP Ravi Prakash Kasapuram Village, Alampur, Telangana State with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity.
19.	Representation received from Sri D.Venkateshara Reddy, Poolathota village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment opportunities, and also will develop the surrounding village
20.	Representation received from Sri. G.Jaghan Mohan, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment opportunities in the surrounding village
21.	Representation received from Sri. S.K.Noor Ahmed, Alampur, Telangana State extending his support for the expansion activity as it will employment opportunities to the local villages
22.	Representation received from Sri.Lakshman, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as it will provide employment opportunities to the local village
23.	Representation received from Sri.Surya Chandra Reddy, Poolathota village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management to provide employment to the local villages, develop the surrounding villages and also to protect the environment in the area.
24.	Representation received from Sri. T.Madhu, E.Tandrapadu with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance
25.	Representation received from Sri. R Raja Sekhar Reddy, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management to provide employment to the local villages, develop the surrounding villages and also to protect the environment in the area.
26.	Representation received from Sri. A Chandra Sekhar with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as there are no pollution & health problems to the villages to the industry.
27.	Representation received from Sri.Ram Bhopal with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance for expansion activity as there are no pollution & health problems to the villages to the industry.
28.	Representation received from Sri. A.Mattiah (N.G.O), Hyderabad with a

	request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management to adopt the surrounding villages, spend the CSR budget for providing education, health facilities & for protection of environment and also development of green belt.
29.	Representation received from Sri. K.Sreenivasulu, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as provide employment to the local villages.
30.	Representation received from Sri. KK Reddy, Vikas Rural Development Society, Hyderabad with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management to develop the surrounding the villages, for implementation of control measures for Air & Water pollution, providing employment to the local villages and utilization of CSR budget for education & health facilities and also for environmental protection in the area.
31.	Representation received from Sri J Sanjeev President, Praja Telangana Journalist Welfare Association with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management for utilization of CSR budget for education & health facilities and also for environmental protection in the area, to develop the green belt develop and improvement of Pollution Control Measures.
32.	Representation received from Sri.P.Kiran Kumar Reddy (N.G.O) with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management to adopt the surrounding villages, spend the CSR budget for providing education, health facilities & for protection of environment and also development of green belt.
33.	Representation received from Sri.Shiva Prasad with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
34.	Representation received from Sri.B Narasimulu & Others, Gondiparla village extended his support for expansion activity as it will provide employment to the local villages
35.	Representation received from Sri.Partha Saradi Reddy extended his support for expansion activity as it will provide employment to the local villages
36.	Representation received from Sri N Ramakrishnudu extended his support for expansion activity as it will provide employment to the local villages
37.	Representation received from Sri N.N Reddy extended his support for expansion activity as it will provide employment to the local villages
38.	Representation received from Sri K.Venkana extended his support for expansion activity as it will provide employment to the local villages
39.	Representation received from Sri.C.Krishana Murthy extended his support for expansion activity
40.	Representation received from Sri.K Venkateshwarlu, Jaharapuram village, Kurnool District extended his support for expansion activity as it will provide employment to the local villages
41.	Representation received from Sri.Kumar, E.Tandrapadu village extended his support for expansion activity as it will provide employment to the local villages
42.	Representation received from Sri Ramana Murthy Sharama extended his support for expansion activity as it will provide employment to the local villages
43.	Representation received from Sri.M Venkata Ramudu extended his support for expansion activity.

44.	Representation received from Sri.Syed Jani Basha & Others extended his support for expansion activity as it will provide employment to the local villages
45.	Representation received from Sri.R.Pratap, Gargapuram, Kurnool District extended his support for expansion activity as it will provide employment to the local villages
46.	Representation received from Sri. T. Jayanna E.Tandrapadu village extended his support for expansion activity as it will provide employment to the local villages
47.	Representation received from Sri.N.V.V Satyanarayanulu extended his support for expansion activity
48.	Representation received from Sri.V.Venkata Ramana extended his support for expansion activity as it will provide employment to the local villages
49.	Representation received from Sri.R.V.Ramanaih extended his support for expansion activity as it will provide employment to the local villages
50.	Representation received from Sri B.Sai Baba requesting the management to take him back into the service of the factory.
51.	Representation received from Sri.M Bala Gangadhar Naidu, E.Tandrapadu village extended his support for expansion activity
52.	Representation received from Smt.P Uday Banu, Gondiparla village extended his support for expansion activity as it will provide employment to the local villages
53.	Representation received from Sri. B Sekhar Babu, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management for the development of the surrounding villages
54.	Representation received from Sri G.V Krishan Kanth Reddy, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
55.	Representation received from Sri A. Uday Kumar extended his support for expansion activity as it will provide employment to the local villages and also there are no pollution problems from the industry
56.	Representation received from Sri.K.V.V Prasad, Gondiparla village, Kurnool, extended his support for expansion activity
57.	Representation received from Sri. M Nagaraju, Gondiparla village, extended his support for expansion activity as management provided education facilities, drinking water supply and employment opportunities to the local villages
58.	Representation received from Sri. Nagendra, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
59.	Representation received from Sri M Sekhar, E.Tandrapadu village extending support for the expansion activity as there are no pollution problems from the industry and industry is providing employment to the local villages.
60.	Representation received from Sri Jaya Ramudu, E.Tandrapadu village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.
61.	Representation received from Sri K.Maheswara Rao extending support for the expansion activity as it will provide employment.
62.	Representation received from Sri Sureswara Reddy extending support for the expansion activity.

63.	Representation received from Sri C. Maddiletti, E.Tandrapadu, extending support for the expansion activity.
64.	Representation received from Sri B.Guru Swami E.Tandrapadu, extending support for the expansion activity as it will provide employment to the villages.
65.	Representation received from Sri B.Tulasi Ram, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages.
66.	Representation received from Sri BC Maddiletti, Gondiparla village extending his support for the expansion activity as it will provide employment to the villages.
67.	Representation received from Sri Laal Swami extending his support for the expansion activity.
68.	Representation received from Smt. Lakshmi, E.Tandrapadu village extending his support for the expansion activity as it will provide employment to the local villages.
69.	Representation received from Sri.S.Jammana, E.Tandrapadu village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
70.	Representation received from Sri.T.Sukanna E.Tandrapadu village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
71.	Representation received from Sri V.Bheemesh E.Tandrapadu village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
72.	Representation received from Sri B Giddiah & Others extending his support for the expansion activity as it will provide employment to the local villages
73.	Representation received from Sri G Rangaswamy, Doddipadu village extending his support for the expansion activity as it will provide employment to the local villages and also there are no pollution problems from the industry.
74.	Representation received from Sri Hari Narayana E.Tandrapadu village to recommend MoEF & CC, GoI for issue of Environmental Clearance
75.	Representation received from Sri T.Mahendra, E.Tandrapadu village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance
76.	Representation received from Sri T.Chinna Shiva & Others, E.Tandrapadu village to recommend MoEF & CC, GoI for issue of Environmental Clearance
77.	Representation received from Sri T.Bala Raju, E.Tandrapadu village suggested to recommend MoEF & CC, GoI for issue of Environmental Clearance
78.	Representation received from Sri K.Venkateshwarlu, E.Tandrapadu village with a request to take him on casual roles in the factory instead of through outsourcing agency
79.	Representation received from Sri M Raja Sekhar E.Tandrapadu village with a request to provide employment opportunity to him in the industry
80.	Representation received from Sri M.Nagaraju MPTC, Gondiparla village and Smt L Hussainamma Sarpanch extended the support for expansion of the industry and suggested the management to provide employment opportunities to the local villages and to protect the environment.

81.	Representation received from Sri K.Govind, Gondiparla village with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as it will provide employment to the local villages
82.	Representation received from Sri T.Srinivasulu, Gondiparla village extended his support to expansion activity as it will provide employment to the local villages and suggested the management for the development of village and also protection of the environment
83.	Representation received from Sri M.Nagaraju MPTC Gondiparla village, requested the authorities for allocation of land for construction of indoor stadium in the village.
84.	Representation received from Smt K Lakshmi Devi Sarpanch Gondiparla village, requested the authorities for allocation of 1.0 Acre of land for construction of indoor stadium in the village, and also allocation of 0.5 Acres of land for construction of compost yard in the village.
85.	Representation received from Sri S.S.L Prasad & Others Gondiparla village, requested the management for providing employment opportunities for local villagers for CMS plant -II, providing free education and employment opportunities for the women in the village, construction of houses for the poor people in the village & construction of hospitals in the village. He also requested for water supply to their village
86.	Representation received from Sri Y.Chinna Kesava Reedy, Vanastahaliapuram, Hyderabad with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management provide local employment, spend the CSR funds in the local villages, conduction medical camps, providing skill development programs to their villages.
87.	Representation received from Smt N.Anatha Lakshmi Surpanch Panchalingala, extended her support for expansion activity as it will develop their village.
88.	Representation received from Sri K.Venkata Swamy MPTC -II, E.Tandrapadu, with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance and suggested the management provide local employment.
89.	Representation received from Sri M.Nagaraju MPTC, Zeheer & Others, Gondiparla village, extended their support for expansion activity as it will provide employment opportunity to their village.
90.	Representation received from Smt Lakshmiddevamma Surpanch, Govind & Others, Gondiparla village extended their support for expansion activity as it will provide employment opportunity to their local village.
91.	Representation received from Sri P Satyanarayana, E.Tandrapadu extended their support for expansion activity as it will provide employment opportunity to their local village.
92.	Representation received from Sri Rajasekhar Reddy & Others, Gondiparla village, with a request to recommend MoEF & CC, GoI for issue of Environmental Clearance as the proposed expansion will provide employment to the villagers and also will develop their village.
93.	Representation received from Sri B.Venkateshwarlu Ex.Surpanch, E.Tandrapadu extended their support for expansion activity as it will provide employment opportunity to their village.



THE NEW
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TIRUPATI

SATURDAY 28.10.2017



ANDHRA PRADESH POLLUTION CONTROL BOARD REGIONAL OFFICE, KURNOOL

1st Floor Shankar Shopping Complex, Krishna Nagar, Main Road, Kurnool - 518 002.
Ph: 08512-235800, email: rokn1-ee1@appcb.gov.in

ENVIRONMENTAL PUBLIC HEARING NOTIFICATION

In accordance with the Notification No. S.O.1533 dated September 14th, 2006 and its subsequent amendments of Ministry of Environment, Forests & Climate Change, Government of India, A.P. Pollution Control Board hereby notifies an Environmental Public Hearing consultation on the proposal of **M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL)** for increasing the production capacity of their existing Chlor-Alkali Chloromethanes and also for inclusion of Chlorodifluoromethane plant at Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc., Gondipalle (V), Kurnool (M), Kurnool District. The details of the proposed activity are as follows:

1. Name of the Company with Address & Telephone Number	M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc., Gondipalle (V), Kurnool (M), Kurnool District. Tel: 08512-235800 & 08518-235800 Email ID: sraacl@rediffmail.com
2. Location of the proposed Project with Survey No's and extent of the land	M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc., Gondipalle (V), Kurnool (M), Kurnool District. Extent of land: 152.5 Ha
3. Name of the Authorized person to be contacted with Address and Telephone Number	Sh. N.Jayawanth Reddy Executive Director (Tech), M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Gondipalle (V), Kurnool (M), Kurnool District. Mobile : 9849379664 / 9848715517 Tel: 08512-235800 & 08518-235800 Email ID: sraacl@rediffmail.com
4. Capital cost of the proposed project	Rs. 350 Crores
5. Line of Activity	Expansion of Chlor-Alkali, Chloromethanes and also for inclusion of Chlorodifluoromethane plant
6. Environmental Consultants	M/s. Team Labs and Consultants, Ameerpet, Hyderabad
7. Date, Time & Venue of the Public Hearing	Date : 28.11.2017; Time : 11.00 AM Venue: Near the existing and premises i.e. in the open area opposite to the main gate of M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc., Gondipalle (V), Kurnool (M), Kurnool District
8. Place of the availability of the Draft EIA/EMP & Executive Summary (Telugu & English) on the proposed project which are kept open for general public	<ul style="list-style-type: none"> i. Office of the Collector & District Magistrate, Kurnool, Kurnool District ii. Office of the Chief Executive Officer, Zila Parishad, Kurnool iii. Office of General Manager, District Industries Center, Kurnool, Kurnool District iv. Office of the MoEF & CC, Govt. Regional office (South-Eastern Zone), Ministry of Environment, Forest and Climate Change, Regional Office, 1st and 2nd Floor, HEPIC Building, No 34, Cathedral Garden Road, Nungambakkam, Chennai: Tamilnadu v. Andhra Pradesh Pollution Control Board, Zonal Office, Krishna Nagar, Kurnool vi. Andhra Pradesh Pollution Control Board, Regional Office, Krishna Nagar, Kurnool vii. Office of the Tahsildar, Kurnool (M), Kurnool District viii. Gram Panchayat Office, Gondipalle (V), Kurnool Mandal and District

The concerns of the local affected people, if any, on the proposed project are invited within 30 days from the date of publication of this notification in writing to the undersigned officer of the A.P. Pollution Control Board, Kurnool and / or they can participate in the proceedings of the public hearing on the date and venue specified above.

Date: 27/10/2017
Place: Kurnool

Sd/- **Environmental Engineer,**
A.P. Pollution Control Board, Regional Office, Kurnool



ANDHRA PRADESH POLLUTION CONTROL BOARD REGIONAL OFFICE, KURNOOL

1st Floor, Shankar Shopping Complex, Krishna Nagar Main Road, Kurnool-518002
Ph.08518-235800, email: rokn-eek@appcb.gov.in.

ENVIRONMENTAL PUBLIC HEARING NOTIFICATION

In accordance with the Notification No.S.O.1533 dated September 19th,2006 and its subsequent amendments of Ministry of Environment Forests & Climate Change, Government of India, A.P.Pollution Control Board hereby notification on Environmental Public Hearing Consultation on the proposal of **Ms.Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL)** for increasing the production capacity of their existing Chlor Alkali, Chloromethanes and also for inclusion of Chlorodifluoromethane plant at Sy.No.51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/202, 2C1/A2, 2C1/A3, 2C2/C, 2C/1, 2F, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc.,Gondiparla (V),Kurnool (M), Kurnool District. The details of the proposed activity are as follows:

1. Name of the company with address & Phone Number	Ms. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/202, 2C1/A2, 2C1/A3, 2C2/C, 2C/1, 2F, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc.,Gondiparla (V),Kurnool (M), Kurnool District. Tel:08518-260006, 97 & 08 Email ID: sraacl@rediffmail.com
2. Location of the proposed project with Survey No's and Extent of the land	Ms. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/202, 2C1/A2, 2C1/A3, 2C2/C, 2C/1, 2F, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc., Gondiparla (V),Kurnool (M), Kurnool District. Extent of land: 152.5 Ha.
3. Name of the Authorized person to be contacted with address and Telephone Number	Sri N.Jayawathi Reddy Executive Director (Tech), Ms. Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Gondiparla (V),Kurnool (M),Kurnool District, Mobile:9948079064/9848076597, Tel:08518-234006, 97 & 08, Email ID: sraacl@rediffmail.com
4. Capital Cost of the Proposed Project	Rs.540 Crores
5. Line of Activity	Expansion of Chlor-Alkali, Chloromethanes and also for inclusion of Chlorodifluoromethane plant
6. Environmental Consultants	M/s. Team Labcloud Consultants, Ammerpet, Hyderabad
7. Date/Time/Venue of Public Hearing	Date: 29.11.2017, Time: 11.00AM Venue: Near the existing work premises i.e. in the open area opposite to the main gate of Ms.Sree Rayalaseema Alkalies and Allied Chemicals Limited (SRAACL) Sy. No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/202, 2C1/A2, 2C1/A3, 2C2/C, 2C/1, 2F, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P etc.,Gondiparla (V),Kurnool (M), Kurnool District.

8. Plans of the Availability of the Draft EIA-EMP and Executive Summary (Telugu & English) on the Proposed Project which are kept open for general public:

- Office of the Collector & District Magistrate, Kurnool, Kurnool District
- Office of the Chief Executive Officer, Pilla Parishad, Kurnool
- Office of General Manager District Industries Centre, Kurnool, Kurnool District
- Office of the M&E & CC, J&S, Regional office Gouthi, Eastern Zone, Ministry of Environment, Forest and Climate Change, Regional Office, 1st and 2nd Floor, HPOC, Building No.34, Cultural Garden Road, Vengal Rao Nagar, Chennai, Tamil Nadu.
- Andhra Pradesh Pollution Control Board, Regional Office, Krishna Nagar, Kurnool
- Andhra Pradesh Pollution Control Board, Regional Office, Kothamangalakota Nagar, Kurnool
- Office of the Tehsildar, Kurnool (M), Kurnool District.
- Team Parachayot Office, Gondiparla (V), Kurnool Mandal and District

The Concerns of the local affected people, if any, on the proposed project are invited within 30 days from the date of publication of this notification in writing to the undersigned officer of the A.P.Pollution Control Board, Kurnool and for they can participate in the proceedings of the public hearing on the date and venue specified above.

Date: 27.10.2017,
Place: Kurnool

Sd/- Environmental Engineer, A.P. Pollution Control Board,
Regional Office, Kurnool.

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

4. COMPLIANCE OF TERMS OF REFERENCE

**Project No. 0118-13-03
January 2018**

**Sree Rayalaseema Alkalies and Allied Chemicals Limited
Gondiparla Village, Kurnool District,
Andhra Pradesh – 518 004
Phone: +91 98480 79064
E-mail: sraaclabs@rediffmail.com**

**STUDIES AND DOCUMENTATION BY
TEAM Labs and Consultants
B-115-117 & 509, Annapurna Block,
Aditya Enclave, Ameerpet,
Hyderabad-500 038.
Phone: 040-23748 555/23748616,
Telefax: 040-23748666**

**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**

J-11011/84/2016-IA II (I)
Government of India
Ministry of Environment, Forest and Climate Change
(I.A. Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi – 110 003

E-mail: lk.bokolia@nic.in
Telefax: 011-24695313
Dated: 21st June, 2016

To,

Shri Jaswanth Reddy
Executive Director (Technical)
M/s Sree Rayalaseema Alkalies and Allied Chemicals Limited
Village Gondiparla, Mandal Kurnool
Andhra Pradesh-518004

Email.: sraaclab@rediffmail.com ; Fax.: 08518-280098

Subject: Proposed expansion of Synthetic Organic Chemicals and Coal based power plant (76 MW) at Survey No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Village Gondiparla, Mandal and District Kurnool, Andhra Pradesh by M/s Sree Rayalaseema Alkalies And Allied Chemicals Ltd.- reg. TOR

Ref. No.: Your Proposal no. IA/AP/IND2/50625/2016; dated 26th February, 2016.

Sir,

Kindly refer your proposal no IA/AP/IND2/50625/2016 dated 26th February, 2016 along with project documents including Form-I, Pre-feasibility Report and draft 'Terms of Reference' as per the EIA Notification, 2006. It is noted that the proposal is for expansion of Synthetic Organic Chemicals and Coal based power plant at Survey No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Village Gondiparla, Mandal and District Kurnool, Andhra Pradesh by M/s Sree Rayalaseema Alkalies And Allied Chemicals Ltd. The following product will be manufactured under proposed project:

S. No	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chloro-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (Or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	-	50
7	Sodium Sulphate	TPD	-	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride	TPD	7.6	7.6	15.2
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	-	10	10

20

IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	-	76
2	Power generation Furnace Oil (31 MW - Standby)	MW			

2.0 Draft Terms of Reference (TOR) have been discussed and finalized during 7th Expert Appraisal Committee (Industry-2) Meeting held during 28-29th April, 2016 for preparation of EIA/EMP report. The Committee prescribed the following Specific and Additional TOR in addition to Generic TOR provided at Annexure-I (refer to Ministry's website) for preparation of EIA-EMP report:

A. Specific TOR

1. Details on solvents to be used, measures for solvent recovery and for emissions control.
2. Details of process emissions from the proposed unit and its arrangement to control.
3. Work zone monitoring arrangements for hazardous chemicals.
4. Detailed effluent treatment scheme including segregation of effluent streams for units adopting 'Zero' liquid discharge.
5. Action plan for odour control to be submitted.
6. A copy of the Memorandum of Understanding signed with cement manufacturers indicating clearly that they co-process organic solid/hazardous waste generated.
7. Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.
8. Action plan for utilization of MEE/dryers salts.
9. Material Safety Data Sheet for all the Chemicals are being used/will be used.
10. Authorization/Membership for the disposal of solid/hazardous waste in TSDF are being used/will be used.
11. Authorization/Membership for the disposal of solid/hazardous waste in TSDF.
12. Risk assessment for storage and handling of hazardous chemicals/solvents. Action plan for handling & safety system to be incorporated.
13. Arrangements for ensuring health and safety of workers engaged in handling of toxic materials.
14. Details on demand of the product- chlorine and its associated products.
15. Details on raw materials used in the production of chlorine (sodium chloride, potassium chloride, etc.), its storage and handling.
16. Details of proposed source - specific pollution control schemes (salt washing, filtration, cell ventilation as, chlorine handling and safety, etc.) and equipments to meet the national standards.
17. Details on products to be made and handling-chlorine, caustic soda, etc.
18. Details on tail gas treatment.
19. Details on requirement of energy and water alongwith its source and authorization from the concerned department.
20. In case of modernization of existing mercury based chlor-alkali plants with membrane cell Process (MBCP) industries or new units in the existing industry premises, remediation measures adopted to restore then environmental quality of the ground water, soil, crop, air, etc., are affected due to salinity and a detailed compliance to the prior environmental clearance/ consent conditions.
21. Details on ground water quality and surface water quality of nearby water sources and other surfaced rains. The parameters of water quality may include Residual chlorine*, TDS*, alkalinity*, pH* & Mercury* (in water & sediment), etc. (*- As applicable)
22. Details on existing ambient air quality and expected, emissions for PM10, PM2.5, SO2*, NOx*, CO2*, CO*, Chlorine*, acid mist* etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet AAQ standards. (*-As applicable)
23. Specific programme to monitor safety and health protection of workers.
24. Risk assessment should also include leakages and location near to caustic soda plant & proposed measures for risk reduction

25. Details of the emergency preparedness plan for chlorine/ Hydrogen storage, handling and transportation and on- site and off- site disaster management plan.


B. Additional TOR

- i. Public hearing to be conducted and issues raised and commitments made by the project proponent on the same should be included in EIA/EMP Report in the form of tabular chart with financial budget for complying with the commitments made.
- ii. Detailed Plan for fresh water reduction by recycles and reuse within the plant.
- iii. Detailed plan for Coal handling and Ash management.
- iv. A separate chapter on status of compliance of Environmental Conditions granted by Centre to be provided. As per circular dated 30th May, 2012 issued by MoEF, a certified report by RO, MoEF on status of compliance of conditions on existing unit to be provided in EIA-EMP report.

3.0 These 'TORs' should be considered for the preparation of EIA/EMP for expansion of Synthetic Organic Chemicals and Coal based power plant at Survey No. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Village Gondiparla, Mandal and District Kurnool, Andhra Pradesh by M/s Sree Rayalaseema Alkalies And Allied Chemicals Ltd. in addition to all the relevant information as per the 'General Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. The EIA/EMP as per TORs should be submitted to the Chairman, Andhra Pradesh Pollution Control Board, for public consultation. The SPCB shall conduct the public hearing/public consultation as per the provisions of EIA notification, 2006.

4.0 You are requested to kindly submit the final EIA/EMP prepared as per TORs and incorporating all the issues raised during Public Hearing / Public Consultation 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.***

5.0 The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/ National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc.



(Lalit Bokolia)
Additional Director

Copy to:

- 1 Rajeshwar Tiwari, Member Secretary, Andhra Pradesh Pollution Control Board, 2nd Floor, HUDA Complex, Maitrivanam, S.R. Nagar, Hyderabad - 500 036, A. P.
- 2 Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), 1st and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 34.



(Lalit Bokolia)
Additional Director

4(d): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR CHLOR ALKALI PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

A. STANDARD TERMS OF REFERENCE

- 1) Executive Summary
- 2) Introduction
 - i. Details of the EIA Consultant including NABET accreditation
 - ii. Information about the project proponent
 - iii. Importance and benefits of the project
- 3) Project Description
 - i. Cost of project and time of completion.
 - ii. Products with capacities for the proposed project.
 - iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
 - iv. List of raw materials required and their source along with mode of transportation.
 - v. Other chemicals and materials required with quantities and storage capacities
 - vi. Details of Emission, effluents, hazardous waste generation and their management.
 - vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
 - viii. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided
 - ix. Hazard identification and details of proposed safety systems.
 - x. Expansion/modernization proposals:
 - a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/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 the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing Iexisting 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

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating 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.

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 considered.
- ii. A toposheet 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 all eco-sensitive areas and environmentally sensitive places)
- iii. Details w.r.t. option analysis for selection of site
- iv. Co-ordinates (lat-long) of all four corners of the site.
- v. Google map-Earth downloaded of the project site.
- vi. Layout maps indicating 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 Area indicating location of unit within the Industrial area/Estate.
- vii. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
- viii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)
- ix. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area.
- x. Geological features and Geo-hydrological status of the study area shall be included.
- xi. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km 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. Details of Flood Level of the project site and maximum Flood Level 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 possession of the land.
- xiii. R&R details in respect of land in line with state Government policy.

5) Forest and wildlife related issues (if applicable):

- i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)
- ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland **(in case of projects involving forest land more than 40 ha)**

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

- iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
 - 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 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
 - vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife.
- 6) Environmental Status
- i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.
 - ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO₂, NO_x, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.
 - iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM 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.
 - 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.
 - v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.
 - vi. Ground water monitoring at minimum at 8 locations shall be included.
 - vii. Noise levels monitoring at 8 locations within the study area.
 - viii. Soil Characteristic as per CPCB guidelines.
 - 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.
 - 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 are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.
 - xi. Socio-economic status of the study area.

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

7) Impact and Environment 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, the AQIP Modelling 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 AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.
- ii. Water Quality modelling - in case of discharge in water body.
- iii. Impact of the transport of the raw materials 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.
- iv. A note on treatment of wastewater 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.
- v. Details of stack emission and action plan for control of emissions to meet standards.
- vi. Measures for fugitive emission control
- vii. Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.
- viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.
- ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 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.
- x. Action plan for rainwater 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 reduce the water requirement from other sources.
- xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.
- xii. Action plan for post-project environmental monitoring shall be submitted.

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

- xiii. 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.
- 8) Occupational health
- i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers
 - ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & 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.
 - iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible 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,
 - iv. Annual report of health status of workers with special reference to Occupational Health and Safety.
- 9) Corporate Environment Policy
- i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
 - ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
 - iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.
 - iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders 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.
- 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 time

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

- 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.
- 13) A tabular chart with index for point wise compliance of above TOR.

B. SPECIFIC TERMS OF REFERENCE FOR EIA STUDIES FOR CHLOR ALKALI INDUSTRIES

1. Details on demand of the product- chlorine and its associated products.
2. Details on raw materials used in the production of chlorine (sodium chloride, potassium chloride, etc.), its storage and handling.
3. Details of proposed source - specific pollution control schemes (salt washing, filtration, cell ventilations as, chlorine handling and safety, etc.) and equipments to meet the national standards.
4. Details on products to be made and handling-chlorine, caustic soda, etc.
5. Details on tail gas treatment.
6. Details on requirement of energy and water along with its source and authorization from the concerned department.
7. In case of modernization of existing mercury based chlor-alkali plants with membrane cell Process (MBCP) industries or new unit in the existing industry premises, remediation measures adopted to restore then environmental quality of the ground water, soil, crop, air, etc., are affected due to salinity and detailed compliance to the prior environmental clearance/ consent conditions.
8. Details on ground water quality and surface water quality of near by water sources and other surfaced rains. The parameters of water quality may include Residual chlorine*, TDS*, alkalinity*, pH* & Mercury* (in water & sediment), etc. (*- As applicable)
9. Details on existing ambient air quality and expected, emissions for PM10, PM2.5, SO2*, NOx*, CO2*, CO*, Chlorine*, acid mist* etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet AAQ standards. (*-As applicable)
10. Specific programme to monitor safety and health protection of workers.
11. Risk assessment should also include leakages and location near to caustic soda plant & proposed measures for risk reduction
12. Details of the emergency preparedness plan for chlorine/ Hydrogen storage, handling and transportation and on- site and off- site disaster management plan.

Compliance of Terms of Reference

Compliance of Standard TOR for “Chlor-Alkali Projects” Issued by MoEF&CC for EIA/EMP report for Projects/Activates requiring Environmental Clearance Under EIA Notification, 2006

S.No	Compliance of Terms or Reference		Response
A. STANDARD TERMS OF REFERENCE			
1	Executive Summary		Included in EIA report.
2	Introduction		
	i.	Details of the EIA Consultant including NABET accreditation	EIA Consultants: Team Labs and Consultants List of QCI/NABET Consultants: S.No.141 (Rev. 61 - January 05, 2018)
	ii.	Information about the project proponent	Presented in Chapter 1 of EIA report at Page No. 1-1
	iii.	Importance and benefits of the project	Presented in Chapter 1 of EIA report at Page No. 1-1
3	Project Description		
	i.	Cost of project and time of completion.	Cost of Project for Proposed Expansion is 360 crores.
	ii.	Products with capacities for the proposed project.	Presented in Chapter 1 of EIA report at Page No. 1-2
	iii.	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.	Presented in Chapter 1 of EIA report at Page No. 1-3. The proposed expansion is within existing plant site Total land area (existing): 152.4 ha.
	iv.	List of raw materials required and their source along with mode of transportation.	Presented in Chapter 7 of EIA report at Page No. 7-4
	v.	Other chemicals and materials required with quantities and storage capacities	Presented in Chapter 7 of EIA report at Page No. 7-4
	vi.	Details of Emission, effluents, hazardous waste generation and their management.	Presented in Chapter 10 of EIA report. Effluents: 10-3 to 10-7 Emissions: 10-8 to 10-19 Hazardous Waste: 10-19 to 10-21.
	vii.	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	Total water required: 15.684 MLD Fresh water: 15.167 MLD Recycled water: 0.157 KLD* Detailed water balance is presented in Chapter 2 of EIA Report at Page No. 2-14 to 2-16
	viii.	Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided	Presented in Chapter 2 of EIA Report at Page No. 2-2 to 2-13
	ix.	Hazard identification and details of proposed safety systems.	Presented in Chapter 7 of EIA report
	x.	Expansion/modernization proposals:	
		a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from	Copy of Environmental Clearance and status of compliance of conditions stipulated in EC presented in Annexure

		MOEF/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 the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report.	- I. Point wise compliance of Consent for Operate (CFO) Presented at Annexure - II.
		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 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.	Not Applicable
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 considered.	M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, Sy.No's - 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh. The proposed expansion is within existing plant site Total land area (existing): 152.4 ha
	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 all eco-sensitive areas and environmentally sensitive places)	Presented in Chapter 1 of EIA report at Page No. 1-5.
	iii.	Details w.r.t. option analysis for selection of site	Proposal is for expansion of manufacturing capacity within existing plant site.
	iv.	Co-ordinates (lat-long) of all four corners of the site.	The site is located at the intersection of 15° 49' 30" (N) latitude and 78° 4' 30" (E) longitude.
	v.	Google map-Earth downloaded of the project	Enclosed at Annexure - I

		site.	
	vi.	Layout maps indicating 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 Area indicating location of unit within the Industrial area/Estate.	Plant layout is presented in Chapter 1 of EIA report at Page No. 1-6
	vii.	Photographs of the proposed and existing (if applicable) plant site. If existing, show Photographs of plantation/greenbelt, in particular.	Photographs of Plant site is presented in Chapter 3 of EIA report at Page No. 3-2
	viii.	Land use break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)	Plant layout is presented in Chapter 1 of EIA report at Page No. 1-8
	ix.	A list of major industries with name and type within study area (10km radius) shall be Incorporated. Land use details of the study area	Land use and Land Cover map of the study area is presented in Chapter 3 of EIA report at Page No. 3-8
	x.	Geological features and Geo-hydrological status of the study area shall be included.	Presented in Chapter 3 of EIA report at Page No. 3-4 to 3-6
	xi.	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km 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. Details of Flood Level of the Project site and maximum Flood Level of the river shall also be provided. (mega green field projects)	Drainage pattern of the impact area is presented in Chapter 3 of EIA report at Page No. 3-16
	xii.	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	The proposed expansion is within existing plant. Total land area (existing): 152.4 ha
	xiii.	R&R details in respect of land in line with state Government policy.	Not Applicable. Expansion within existing site area.
5	Forest and wildlife related issues (if applicable):		
	i.	Permission and approval 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 forestland (in case of projects involving forest land more than 40 ha)	The present proposal is for expansion within existing plant site, however land use map is presented in Chapter 3 of EIA report at Page No. 3-8
	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	There are no National Parks,

		National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the 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.	Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals within the impact area of 10 km.
	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 data using temperature, relative humidity, hourly wind speed and direction and rainfall.	Site-specific micrometeorological data presented in Chapter 3 of EIA report at Page No. 3-19 to 3-24
	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 CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	AAQ data presented in Chapter 3 of EIA report at Page No. 3-25 to 3-30
	iii.	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM 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.	AAQ data is presented in Chapter 3 of EIA report at Page No. 3-29 to 3-30
	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.	Surface water Monitoring locations presented in Chapter 3 of EIA report at Page No. 3-13 to 3-18.
	v.	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.	No. Sy.No's - 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60, 62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A, 62 B, 63, 64, 70/C2, 72/P, Gondiparla village, Kurnool mandal and district, Andhra Pradesh.
	vi.	Ground water monitoring at minimum at 8 locations shall be included.	Ground Monitoring locations presented in Chapter 3 of EIA report at Page No.

			3-13 to 3-18.
	vii.	Noise levels monitoring at 8 locations within the study area.	Noise levels monitoring is presented in Chapter 3 of EIA report at Page No. 3-31 to 3-33
	viii.	Soil Characteristic as per CPCB guidelines.	Soil Characteristics is presented in Chapter 3 of EIA report at Page No. 3-8 to 3-12
	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 additional traffic generated due to the proposed expansion shall be 20 truck trips per hour.
	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 are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	Flora and Fauna of the Impact area is presented in Chapter 3 of EIA report at Page No. 3-41 to 3-51
	xi.	Socio-economic status of the study area.	Socio-Economic status of the impact area is presented in Chapter 3 of EIA report at Page No. 3-34 to 3-42
7	Impact and Environment 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, the AQIP Modelling 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 AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	<p>Predictions of ground level concentrations using ISC-AERMOD using ISCST3 model is of the pollutants presented in Chapter 4 of EIA report at Page No. 4-13 to 4-20.</p> <p>There will be 250 - 270 truck trips per day after expansion. Emissions considered from transport of vehicles as line source.</p>
	ii.	Water Quality modelling - in case of discharge in water body	Not applicable
	iii.	Impact of the transport of the raw materials 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.	<p>There will be 230 - 250 truck trips per day.</p> <p>Truck transport Incidents and concerns are presented in Chapter 10 of EIA report at Page No. 10-30.</p>
	iv.	A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be	Quantity, quality of effluent generated from different operation is presented in Chapter 10 Chapter 10 of EIA report at

		included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E (P) Rules.	Page No. 10-3 to 10-7. Effluent Treatment System is presented in Chapter 10 of EIA report at Page No. 10-5 to 10-7.
	v.	Details of stack emission and action plan for control of emissions to meet standards.	Presented in Chapter 10 Chapter 10 of EIA report at Page No. 10-10.
	vi.	Measures for fugitive emission control	Presented in Chapter 10 Chapter 10 of EIA report at Page No. 10-8.
	vii.	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover Techniques, Energy conservation, and natural resource conservation.	Presented in Chapter 10 of EIA report at Page No. 10-19 to 10-21. Reduce, reuse and recycled concept is presented in waste-minimization, Energy conservation is presented in Chapter 10 of EIA report at Page No. 10-31.
	viii.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Ash generated from existing boilers are sent to brick manufactures and cement plants
	ix.	Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 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.	Green belt is developed in an area of 89.03 ha. Layout showing green belt development is presented in Chapter 10 at Page No. 10-33.
	x.	Action plan for rainwater 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 reduce the water requirement from other sources.	Storm water pond of capacity 2800 m ³ is developed. Details are presented in Chapter 10 of EIA report at Page No. 10-23.
	xi.	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Total Capital Cost: Rs. 360 crores EMP Cost estimate: Rs. 320 Lakhs Recurring Cost on EMP: Rs. 652.2 Laksh/annum. Details are presented in Chapter 10 at Page no. 10-37
	xii.	Action plan for post-project environmental monitoring shall be submitted.	Presented in Chapter 6 of EIA report at Page No. 6-8.
	xiii.	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.	Disaster Management Plan is presented in Chapter 7 of EIA report at Page No.7-31. Onsite and Offsite Disaster is presented in Chapter 7 of EIA report at Page No.7-32.

8	Occupational Health		
	i.	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	Total: 40 Lakhs/annum PPE: 30 Lakhs/annum Health Check-up: 10 Lakhs/annum
	ii.	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & 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.	Medical health check-up is presented in Chapter 10 of EIA report at Page No. 10-25.
	iii.	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible 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,	Presented in Chapter 10 of EIA report at Page No. 10-24 to 10-27. Suitable PPE is prescribed to the employees working in area where the conc. Exceeds PEL values. Simultaneously the project and R&D team are consulted to suggest mitigative measures and or engineering control measures. The focus shall always be in ensuring concentration within PEL by adopting engineering controls as when requires.
	iv.	Annual report of health status of workers with special reference to Occupational Health and Safety.	Annual report of Health Status of workers is enclosed at Annexure - III
9	Corporate Environment Policy		
	i.	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Corporate Environment Policy is presented in Chapter 10 of EIA report at Page No. 10-34.
	ii.	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Environment engineer is responsible to bring to focus to higher management in case of deviation/ violation of the environmental or forest norms / conditions.
	iii.	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance Conditions? Details of this system may be given.	Environment Management Cell is presented in Chapter 10 of EIA report at Page No. 10-34.

	iv.	Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	Yes. Details of Environment Management Cell is presented in Chapter 10 of EIA report at Page No. 10-34.
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.		Presented in Chapter 10 of EIA report at Page No. 10-2.
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 time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.	Corporate Social Responsibilities - Budget is presented in Chapter 10 of EIA report at Page No. 10-29. The public hearing for the proposed expansion was conducted on 29.11.2017 at industry site.
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 Individual Court case against the Project.
13	A tabular chart with index for point wise compliance of above TOR.		Enclosed at Compliance of Terms of Reference along with EIA & EMP.
B. SPECIFIC TERMS OF REFERENCE FOR EIA STUDIES FOR CHLOR-ALKALI INDUSTRIES			
1	Details on demand of the product – Chlorine and its associated products		Presented in Chapter 2 of EIA Report
2	Details on raw materials used in the production of Chlorine (Sodium chloride, potassium chloride, etc.), its storage and handling.		Not applicable
3	Details of proposed source – Specific pollution control schemes (salt washing, filtration, cell ventilations as, chlorine handling and safety etc) and equipments to meet the national standards.		Presented in Chapter 7 of EIA report at Page No. 7- 5 to 7-12
4	Details on products to be stored and handling – chlorine, caustic soda, etc.		Presented in Chapter 7 of EIA report at Page No. 7- 11 to 7-12
5	Details on tail gas treatment		Presented in Chapter 7 of EIA report at Page No. 7- 28
6	Details on requirement of energy and water along with its source and authorization from the concerned department.		Detailed water balance is presented in Chapter 2 of EIA report at Page No. 2- 14 to 2- 16. The unit obtained permission to abstract water from Tungabhadra River in the order of 20MLD.

7	In case of modernization of existing mercury based chlor-alkali plants with membrane cell process (MBCP) industries or new units in the existing industry premises, remediation measures adopted to restore then environmental quality of the ground water, soil, crop, air etc., are affected due to salinity and a detailed compliance to the prior environmental clearance / consent conditions.	Not Applicable
8	Details on ground water quality and surface water quality of nearby water sources and other surfaced rains. The parameters of water quality may include residual chlorine*, TDS*, alkalinity*, pH*, & Mercury* (in water & sediment). Etc. (* - As applicable)	Presented in Chapter 3 of EIA report at Page No. 3- 13 to 3-18
9	Details on existing ambient air quality and expected, emissions for PM10, PM2.5, SO2*, NOx*, CO2*, CO*, Chlorine*, acidmist* etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet AAQ standards. (* - As applicable)	Presented in Chapter 3 of EIA report at Page No. 3- 29 to 3-30
10	Specific programme to monitor safety and health protection of workers	Presented in Chapter 10 of EIA report at Page No. 10- 24 to 10-27
11	Risk assessment should also include leakages and location near to caustic soda plant & proposed measures for risk reduction.	
12	Details of emergency preparedness plan for chlorine /Hydrogen storage, handling and transportation and on-site and off-site disaster management plan.	Presented in Chapter 10 of EIA report at Page No. 10- 31 to 10-44
A. Specific TOR		
1	Details on solvents to be used, measures for solvent recovery and for emissions control.	Not Applicable
2	Details of process emissions from the proposed unit and its arrangement to control.	Presented in Chapter 10 of EIA report at Page No. 10-10.
3	Work zone monitoring arrangements for hazardous chemicals.	Presented in Chapter 6 of EIA report at Page No. 6-10.
4	Detailed effluent treatment scheme including segregation of effluent streams for units adopting 'Zero' liquid discharge.	Presented in Chapter 10 of EIA report at Page No. 10-6.
5	Action plan for odour control to be submitted.	Presented in Chapter 10 of EIA Report
6	A copy of the Memorandum of Understanding signed with cement manufacturers indicating clearly that they co-process organic solid/hazardous waste generated.	Enclosed at Annexure
7	Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.	Enclosed at Annexure
8	Action plan for utilization of MEE/dryers salts.	No MEE is used for wastewater treatment.
9	Material Safety Data Sheet for all the Chemicals are being used/will be used.	Enclosed at Annexure
10	Authorization/Membership for the disposal of solid/hazardous waste in TSDF.	Enclosed at Annexure

11	Details of incinerator if to be installed.	Presented in Chapter 7 of EIA report at Page No. 7-26 to 7-29.
12	Risk assessment for storage and handling of hazardous chemicals/solvents. Action plan for handling & safety system to be incorporated.	Presented in Chapter 7 of EIA report at Page No. 7-11.
13	Arrangements for ensuring health and safety of workers engaged in handling of toxic materials.	Presented in Chapter 7 of EIA report at Page No. 7-21.
14	Details on demand of the product – Chlorine and its associated products	Presented in Chapter 10 of EIA report at Page No. 10-13.
15	Details on tail gas treatment	Presented in Chapter 10 of EIA report at Page No. 10-17.
16	Details on requirement of energy and water along with its source and authorization from the concerned department.	Detailed water balance is presented in Chapter 2 of EIA report at Page No. 2-14 to 2-16. Details of Utilities is presented in Chapter 2 of EIA report at Page No. 2-14
17	In case of modernization of existing mercury based chlor-alkali plants with membrane cell process (MBCP) industries or new units in the existing industry premises, remediation measures adopted to restore then environmental quality of the ground water, soil, crop, air etc., are affected due to salinity and a detailed compliance to the prior environmental clearance / consent conditions.	Not Applicable
18	Details on ground water quality and surface water quality of nearby water sources and other surfaced rains. The parameters of water quality may include residual chlorine*, TDS*, alkalinity*, pH*, & Mercury* (in water & sediment). Etc. (* - As applicable)	Presented in Chapter 3 of EIA report at Page No. 3-13 to 3-18.
19	Details on existing ambient air quality and expected, emissions for PM10, PM2.5, SO2*, NOx*, CO2*, CO*, Chlorine*, acidmist* etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet AAQ standards. (* - As applicable)	Presented in Chapter 3 of EIA report at Page No. 3-29
20	Specific programme to monitor safety and health protection of workers	Presented in Chapter 7 of EIA report at Page No. 7-34
21	Risk assessment should also include leakages and location near to caustic soda plant & proposed measures for risk reduction.	Presented in Chapter 7 of EIA Report
22	Details of emergency preparedness plan for chlorine /Hydrogen storage, handling and transportation and on-site and off-site disaster management plan.	On-site and off-site disaster management plan presented in Chapter 7 of EIA report at Page No. 7-31. Chlorine /Hydrogen storage, handling and transportation is presented in Page No. 7-21. To 7-25

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	<p><i>than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.</i></p> <p><i>Conditions apply</i></p>	39	Townships and development projects Area	B	8 (b)
141	<p>TEAM Labs and Consultants</p> <p>Address: B- 115 & 509, Annapurna Block, Aditya Enclave, Ameerpet, Hyderabad – 500038</p> <p>e. mail: teamlabs@gmail.com</p> <p>Tel.: 040 – 23748666/ 23748616 09866415966</p> <p><i>Conditions apply</i></p>	1	Mining of minerals including Open cast / Underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous & non ferrous)	A	3 (a)
		9	Cement plants	A	3 (b)
		11	Coke oven plants	B	4 (b)
		13	Chlor-alkali industry	A	4 (d)
		16	Chemical fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			chemical intermediates)		
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		38	Building and construction projects	B	8(a)
		39	Townships and Area development projects	B	8 (b)
142	Terracon Ecotech Pvt. Ltd. Address: 202, Kingston, Tejpal Road, Vile Parle (E), Mumbai 400057, India e. mail: info@terraconindia.com Tel.: 022-2613939/40/41, 9820828087 <i>Conditions apply</i>	2	Off shore and on shore oil and gas exploration, development and production	A	1(b)
		3	River valley, hydel, drainage and irrigation projects	A	1 (c)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		33	Ports, harbours, break waters	A	7 (e)

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

Status of compliance of the conditions stipulated in the Environmental Clearance

**Project No. 0118-13-03
January 2018**

**Sree Rayalaseema Alkalies and Allied Chemicals Limited
Gondiparla Village, Kurnool District,
Andhra Pradesh – 518 004
Phone: +91 98480 79064
E-mail: sraaclabs@rediffmail.com**

**STUDIES AND DOCUMENTATION BY
TEAM Labs and Consultants
B-115-117 & 509, Annapurna Block,
Aditya Enclave, Ameerpet,
Hyderabad-500 038.
Phone: 040-23748 555/23748616,
Telefax: 040-23748666**

**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**



सत्यमेव जयते

भारतसरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS & CLIMATE
CHANGE
Regional Office (South Eastern Zone),
1st & 2nd floor, HEPC Building, No.34, Cathedral Garden Road,
Nungambakkam, Chennai - 600034



29.09.2016 / 1927

To

Shri N. Jeswanth Reddy
Executive Director
SreeRayalaseemaAlkalies and Allied Chemicals Ltd
Gondiporla,
Kurnool District,
Andhra Pradesh-518 004.

- Subject: 1) Expansion by adding Chloromethanes plant at Sy.No.61,62 B,63, Village Gandiporla, Mandal Kurnool, District Kurnool, Andhra Pradesh by M/s. Sree RayalaseemaAlkalies and Allied Chemicals Ltd-Certified Copy of the Compliance Report-Reg.
2) Expansion of Chemical Manufacturing Unit at Gondiporla, Kurnool, Andhra Pradesh by M/s. SreeRayalaseemaAlkalies and Allied Chemicals Ltd-EC-Reg.

Reference: 1) J-11011/619/2009-IA.II (I)dt 14.02.2012.
2) J-11011/653/2007-IA.II (I) dt 26.12.2007.
3) Your letter dated 09.09.2016.

Sir,

With reference to 3rd cited above, please find enclosed herewith a certified copy of the compliance report. This has been approved by the Addl.PCCF(C) vide diary no.1279 dt 28.09.2016.

Yours faithfully

(Dr.C.Kaliyaperumal)
Director (S)

Dr. C. KALIYAPERUMAL, M.E., Ph.D.
Director (S)

Government of India
Ministry of Environment, Forests & Climate Change
Regional Office (South Eastern Zone)
HEPC Building, No.34, Cathedral Garden Road,
Nungambakkam, Chennai-600 034.

Encl: As above

Certified Copy of the Compliance Report

Subject: Expansion by adding Chloromethanes plant at Sy.No.61,62 B,63, Village Gandiporla, Mandal Kurnool, District Kurnool, Andhra Pradesh by M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd

Ref: 1. J-11011/619/2009-IA.II (I) dt 14.02.2012.
2. J-11011/653/2007-IA.II (I) dt 26.12.2007.

Present Status of the Project: The unit is under operation and the project authorities manufacturing the approved products.

Date of Monitoring: 26.09.2016.

A. SPECIFIC CONDITIONS :

S.No.	Conditions	Compliance
i)	All the specific conditions and general conditions specified in the earlier environmental clearance letter accorded vide Ministry's letter No. 11011/653/2007-IA-II dated 26 th December, 2007 shall be implemented.	Complied The Project Authorities (PA) have implemented all the specific conditions and general conditions specified in their earlier environmental clearance letter accorded vide environmental clearance letter no.11011/653/2007-IA-II dated 26 th December, 2007
ii)	National Emission Standards for Organic Chemicals Manufacturing industry issued by the Ministry vide GSR 608 (E) dated 21 st July, 2010 and amended time to time shall be followed by the unit.	Complied. National Emission Standards for Organic Chemicals Manufacturing industry issued by the Ministry vide GSR 608 (E) dated 21 st July, 2010 and amended time to time are followed by the unit as informed .
iii)	Instead of the earlier proposal of having the different section of the proposed chloromethanes plant in 3 different locations, the complete plant of chloromethane shall be installed at one location in the adjacent site measuring about 4 acres.	Complied. As directed they have installed chloromethanes plant in single location adjacent site to existing chloro-alkali plant measuring 4 acres in Sy.No.62A,62B, 63 and 64 of Gondiparla village.
iv)	Production of chloromethane shall start only after the incinerator is ready for incineration of Carbon tetra chloride gas.	Complied The PA informed that production of chloromethane was started only after installation of incinerator to burn carbontetrachloride and heavy ends.
v)	As proposed, HCl emissions from the chloromethane shall be absorbed in demineralised (DM) water in graphite	Complied As proposed they have installed graphite absorber to absorb HCl gases and tail gases

	absorption column to produce HCl (30%). After recovery of HCl, tail gases shall be passed through water scrubber to absorb the traces of HCl. Concentrated acid to be sold as by product.	passed through water scrubber to absorb the traces of HCl. Concentrated acid is sold as by product.
vi)	The gaseous emissions (SO_2 , NO_x , Cl_2 and HCl) and particulate matter from process stack shall conform to the norms prescribed by the CPCB/APPCB from time to time. At no time, the emission levels shall go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly.	Complied The gaseous emissions (SO_2 , NO_x , Cl_2 and HCl) and particulate matter from process stack are within the prescribed by the CPCB/APPCB from time to time. The PA stated that at no time, the emission levels has gone beyond the prescribed standards. The PA assured that in the event of failure of any pollution control system adopted by the unit, the respective unit will not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions are monitored regularly.
vii)	All necessary steps shall be taken for monitoring of chlorine as well as VOCs in the new plant.	Complied. The PA have installed analysers to measure chlorine and VOC.
viii)	Carbon tetra chloride produced as waste gas shall be incinerated in an incinerator.	Complied. The PA have installed incinerator to burn Carbon Tetrachloride in incinerator and make HCl as explained in S.No.iv. Alternatively they have Ozone depletion cell to sell carbon tetra chloride as a feed stock.
ix)	As proposed, steam requirement shall be met from existing co-generation unit.	Complied As proposed, steam requirement is met from existing co-generation unit.
x)	Ambient air quality data shall be collected as per NAAQES standards notified by the ministry vide GSR No. 826 (E) dated 16 th September, 2009. The levels of $\text{PM}_{2.5}$, SO_2 , NO_x , Co, Cl_2 , HCl, HC and VOCs shall be monitored in the ambient air and displayed at a convenient location near the main gate of the company and at important public places. The company shall upload the results of monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the AP Pollution Control Board (APPCB).	Complied. The PA have installed continuous ambient air quality monitoring equipments at three locations as directed by PCB. The monitored data are transmitted to PCB's server. In addition to this, manual monitoring of HCl, Cl_2 , SO_2 , NO_x , SPM etc is also carried out at three locations through an approved laboratory. Out of this three stations one station is in the down wind direction.
xi)	In plant control measures for checking	Complied

	<p>fugitive emissions from all the vulnerable sources shall be provided. Fugitive emissions shall be controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system shall be provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc., shall be regularly monitored. The emissions shall conform to the limits stipulated by the APPCB.</p>	<p>In plant control measures for checking fugitive emissions from all the vulnerable sources are provided. Fugitive emissions are controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system are provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc., are regularly monitored. The emissions levels are within the limits stipulated by the APPCB.</p>
xii)	<p>For further control of fugitive emissions, following steps shall be followed:</p> <ol style="list-style-type: none"> 1. Closed handling system shall be provided for chemicals. 2. Reflux condenser shall be provided over reactor. 3. System of leak detection and repair of pump/pipeline based on preventive maintenance. 4. The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water. 5. Cathodic protection shall be provided to the underground solvent storage tanks. 	<p>Complied.</p> <p>The following steps are taken to control fugitive emissions.</p> <ol style="list-style-type: none"> 1. All chemicals are handled in closed loop. 2. Reflux Condenser are provided over reactors. 3. Preventive maintenance is being followed scrupulously 4. All the storage tanks vents are connected to condenser operating on chilled water and acids are taken from storage tanks to reactors through closed pipeline 5. They do not have any underground solvent storage tanks.
xiii)	<p>The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.</p>	<p>Complied</p> <p>All the existing DG Sets are enclosed with acoustic enclosures to mitigate noise pollution. Adequate stack height is provided for DG Sets.</p>
xiv)	<p>Incinerator along with its pollution control device shall be designed as per CPCB guidelines. After installation of incinerator, a performance evaluation study shall be</p>	<p>Refer below.</p> <p>The PA informed that the incinerator is designed as per CPCB guidelines and also commissioned the incinerator. As</p>



	carried out and report shall be submitted to the respective regional office of the ministry, CPCB and APPCB.	informed by PA the incinerator is used whenever distillation bottom discharged (heavy ends). The PA informed that after few incineration only the performance evaluation study can be conducted because they get distillation bottom discharges (heavy ends) once in six months. The PA have agreed to conduct performance evaluation study and submit the report.
xv)	Total fresh water requirement from Tungabhadra River source after expansion shall not exceed 10,606.65 m ³ /day and prior permission shall be obtained from the concerned authority. A copy of permission shall be submitted to the Ministry's Regional office at Bangalore. No ground water shall be used.	Complied. As stated their existing water consumption is less than 10,606.65 m ³ /day (present consumption is 6000 m ³ /day). They have submitted a copy of the permission to RO.
xvi)	As proposed wastewater shall be segregated into three effluent streams (i.e. Castor oil & sewage, caustic soda plant and CPP) and treated in effluent treatment plant. Treated effluent shall be recycled/reused within the factory premises. Performance evaluation study of the existing ETP shall be carried out and report shall be submitted to the respective region office of the ministry and CPCB. Treated effluent shall be collected in the guard pond. Regular water quality monitoring of guard pond shall be carried out.	Refer below. As proposed the waste water is segregated and they have established separate effluent treatment plant for castor oil plant, caustic soda plant and co-generation plant. Treated effluent is utilized for reuse/ for greenbelt development in company's land. Guard pond is provided. The PA informed that in the beginning the ETP performance was tested and started operating. Regular monitoring of the water quality is being carried out and the performance of the quality of the treated effluent is meeting the standards.
xvii)	Process effluent / any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through dedicated guard pond.	Complied The PA have provided separate drains for industrial effluents and storm water. Guard pond is provided.
xviii)	As proposed, silica gel and calcium chloride shall be sent to the captive secured landfill site.	Complied As proposed they are storing silica gel and calcium chloride in their secured land fill.
xix)	Captive secured landfill site shall be designed as per CPCB guidelines. A performance evaluation study for the existing captive secured landfill site shall be carried out and report shall be submitted to the respective regional office of the MoEF, CPCB and APPCB within three months. All the recommendations made in the study	Complied Captive secured landfill is designed as per CPCB guidelines. As suggested, they have carried out performance evaluation of secured land fill through outside agency viz. M/s. Vimta labs Ltd., Hyderabad and a copy of the same was submitted to RO a copy of the same was



	shall be implemented.	provided during the visit.
xx)	The Company shall strictly comply with the rules and guidelines under manufacture, storage and import of hazardous chemicals (MSIHC) Rules, 1989 as amended time to time. All Transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.	Complied The PA complying with the rules and guidelines under manufacture, storage and import of hazardous chemicals (MSIHC) Rules, 1989 as amended time to time. All Transportation of Hazardous Chemicals are as per the Motor Vehicle Act (MVA), 1989.
xxi)	Peizometer wells shall be installed around secured landfill. Ground water monitoring shall be carried out in every three months and trend analysis shall be carried out and report shall be sent to the CPCB and APPCB.	Complied Four Peizometer wells are installed around captive secured landfill. Ground water monitoring is regularly carried out and records are maintained and reports are sent to CPCB and APPCB.
xxii)	As proposed, no storage of fly ash shall be done at site and fly ash shall be directly transferred from the silo in a well designed covered trucks.	Complied. Fly ash is disposed from silo to specially designed covered trucks and no storage of fly ash.
xxiii)	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 as amendment in 2003. Fly ash shall be provided to cement and brick manufacturers for further utilization. Bottom boiler ash shall be used for landfill of the low lying area and also permission from APPCB shall be obtained.	Complied Fly ash is sold to brick manufacturers, cement industries. Bottom ash is used for land fill in low lying area of company's land.
xxiv)	Rice husk storage shall be done in such a way that it does not get air borne or fly around due to wind. As proposed, rice husk & coal storage yard shall be properly covered.	Complied The PA have installed closed sheds to store coal and rice husk.
xxv)	Dedicated parking facility for loading and unloading of material shall be provided in the factory premises. Unit shall develop and implement good traffic management system for their incoming and outgoing vehicles to avoid congestion on the public road.	Complied. Dedicated parking facility is provided for trucks near their factory premises. They have good traffic management system.
xxvi)	Good sanitary facility shall be provided for truck drivers / workers.	Complied Good sanitary facilities are provided for truck drivers / workers.
xxvii)	As proposed, greenbelt shall be developed in 89.03 Ha out of total land 152.40 Ha as per the CPCB guidelines. Time bound action plan shall be submitted to the Ministry and its respective Regional Office to achieve 89.03 Ha. Greenbelt within 5	Complied. As committed they have already developed greenbelt in 97 Hectors land.



	Years.	
xxviii	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling.	Complied All the precautionary measures are taken in the plant for protection of fire hazards.
xxix)	Occupational health surveillance (OHS) of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Complied. OHS is carried out for all the workers and record is maintained.
xxx)	General housekeeping and cleanliness at the plant site shall be improved.	Complied General housekeeping and cleanliness is good in the factory.
xxxi)	Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc., The housing may be in the form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.	Complied The PA informed that all necessary infrastructure and facilities such as fuel for cooking, toilets, safe drinking water, medical health were provided to the construction labours during the construction time and the structures were removed after the completion of the project works.
xxxi)	Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc., The housing may be in the form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.	Complied, The PA informed that all necessary infrastructure and facilities such as fuel for cooking, toilets, safe drinking water, medical health were provided to the construction labours during the construction time and the structures were in the form of temporary structure and removed after the completion of the project works.

B. GENERAL CONDITIONS

S.No.	Conditions	Compliance
i.	The Project authorities shall strictly adhere to the stipulations made by the A.P. Pollution Control Board.	Complied. The PA informed that all stipulations made by SPCB adhered and the consents are valid up to 28.2.2021.
ii.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from	Complied. Without the Ministry's approval no expansion or modifications were carried out. Now they are going for an expansion and for that they have requested certified



	those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	copy of the compliance report. The details of expansion is given in Annex.I
iii.	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	Complied. The PA have installed continuous ambient air quality monitoring equipments at three locations as directed by PCB. The monitored data are transmitted to PCB's server. In addition to this, manual monitoring of HCl, Cl ₂ , SO ₂ , NO _x , SPM etc is also carried out at three locations through an approved laboratory. Out of this three stations one station is in the down wind direction.
iv.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc., on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz., 75 dBA (day time) and 70 dBA (night time)	Complied. Noise control measures such as acoustic hoods, silencers, enclosures etc., has been provided on all sources of noise generation. The noise levels are monitored at several locations during night and day time and the levels are within the limits.
v.	The company shall harvest rainwater from the rooftops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.	Complied They have developed rooftop rain water harvesting system to recharge the ground water.
vi.	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Complied. Training is being imparted to all employees on safety and health aspects on chemicals handling. Pre-employment and periodical medical examinations are being conducted for all employees on regular basis.
vii.	Usage of Personnel Protection Equipments (PPEs) by all employees / workers shall be ensured.	Complied. The PA have provided PPE such as shoes, helmet and uniform to all employees. Safety dept., is monitoring the usage of PPEs by employees.
viii.	The company shall also comply with all the environmental protection measures and safeguards proposed in the documents	Complied. The PA implementing all the environmental protection measures

	submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing relating to the project shall be implemented.	proposed in the EIA/EMP report and also recommendations made in environmental management and risk mitigation measures relating to the project.
ix.	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area, CSR activities shall be undertaken by involving local villages and administration.	Complied. The PA informed that all relevant measures, as indicated in Public Hearing for improving the socio-economic conditions of the surrounding villages, CSR activities in consultation with local administration has been undertaken.
x.	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Complied The PA informed that the eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment has been undertaken and also informed that the eco-development plan was submitted to the SPCB for approval.
xi.	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Complied. A separate Environmental Management Cell has been set up with full fledged laboratory to carry out the Environmental Management and Monitoring functions.
xii.	The company shall earmark sufficient funds to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.	Complied. The PA informed that sufficient amount (Rs.5 crores) is earmarked for implementing the conditions stipulated by the Ministry and the fund is not diverted for any other purpose.
xiii.	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad / Municipal Corporation, Urban local body and the local NGO, if any, from who suggestions / representations, if any, were received while processing the proposal.	Refer below. The PA informed that they have not received any suggestions or representations from concerned panchayat, zilla parishad, municipal corporation, urban local body and local NGOs while processing the proposal.
xiv.	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental clearance conditions including results of monitored data (both in hard copies as well as by e-	Complied. The PA are submitting six monthly compliance reports both soft and hard copies on the implementation of the conditions to Regional Office of MoEF,



	mail) to the respective Regional Office of MoEF, the respective Zonal office of CPCB and the A.P. Pollution Control Board. A copy of Environmental clearance and six monthly compliance status report shall be posted on the website of the company.	CPCB and A.P. Pollution Control Board and not by e-mail. The same is posed on company's website.
xv.	The environmental statement for each financial year ending 31 st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MOEF by e-mail.	Complied They are regularly sending environment statement for each financial year ending 31 st March in Form-V to A.P. Pollution control Board. The same is posed on company's website.
xvi.	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB / Committee and may also be seen at website of the Ministry at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	Complied. The PA had given advertisement in two local news papers on 19.02.2012 and submitted the copy of the same to RO.
xvii.	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Complied The PA informed that they have informed the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

This has the approval of the Addl.PCCF(C) vide diary no.1279 dt 28.09.2016.


(Dr.C.Kaliyaperumal)
Director(S)

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Director (S)

Government of India
Ministry of Environment, Forests & Climate Change
Regional Office (South Eastern Zone)
HEPC Building, No.34, Cathedral Garden Road,
Nungambakam, Chennai-600 034.

Certified Copy of the Compliance Report

Subject: Expansion of Chemical Manufacturing Unit at Gondiporla, Kurnool, Andhra Pradesh
by M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd-EC-Reg.

Ref: J-11011/653/2007-IA.II (I) DT.26.12.2007.

Present Status of the Project: The unit is under operation and the project authorities manufacturing the approved products. They have installed 76 MW coal based captive power plant. Now they are generating only 12 MW and the rest is taken from EB grid. The furnace oil fired DG sets are kept as stand-by.

Date of Monitoring: 26.09.2016.

A. SPECIFIC CONDITIONS:

S.No.	Conditions	Compliance
(i)	Project shall be based on Membrane Cell Technology only.	Complied. The Project Authority (PA) have installed membrane cell technology electrolyser in their expansion project.
(ii)	The gaseous emissions (SO_2 , NO_x , Cl_2 and HCl) and particular matter along with RSPM from various process units shall conform to the prescribed norms by the concerned authorities from time to time. At no time, the emission levels shall be Beyond the stipulated standards. The stack height shall be as per the CPCB guidelines. In the event of failure of pollution control system(s) adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Further, the company shall interlock the production system with the pollution control devices.	Complied. The PA have installed scrubbing system to control SO_2 , NO_x , Cl_2 , HCl emission and it is below prescribed norms of concerned authorities. They have installed ESP to maintain particulate matter and RSPM is below prescribed norms of concerned authorities. They have provided interlocking systems. The PA informed that at no time, the emission levels has gone beyond the stipulated standards. The stack height are as per the CPCB guidelines. The PA assured that in the event of failure of pollution control system(s) adopted by the unit, the respective unit will not be restarted until the control measures are rectified to achieve the desired efficiency.
(iii)	Low sulphur and low Ash Coal shall be used as Fuel for the Captive Power plant.	Complied. Low sulphur and low ash coal are used as informed as fuel in their captive power plant.
(iv)	For the control of air emission form the Captive Power Plant, Electro Static Precipitator with a stack height of about 90M shall be provided and SPM levels in the flue gas would be less than 50 mg/Nm^3	Refer below. ESP with a stack height of about 81 metre has been provided and the SPM level is within 50 mg/Nm^3 . As they have reduced the capacity of Boiler from 140 TPH to 110 TPH, accordingly chimney height is reduced to 81 mtrs.



(v)	Regular monitoring of ambient air quality shall be carried out including HCl and Chlorine. The location of the existing ambient air quality monitoring stations shall be reviewed in consultation with the SPCB and additional stations shall be set up, if required. It will be ensured that at least one station is in the down wind direction.	Complied. The PA have installed continuous ambient air quality monitoring equipments at three locations as directed by PCB. The monitored data are transmitted to PCB's server. In addition to this, manual monitoring of HCl, Cl ₂ , SO ₂ , NO _x , SPM etc is also carried out at three locations through an approved laboratory. Out of this three stations one station is in the down wind direction.
(vi)	The fugitive emissions in the work zone environment, product, raw material storage area shall be regularly monitored and data shall be submitted to the concerned authorities. The emissions shall be controlled and conform to the limits prescribed by the CPCB in future.	Complied. The fugitive emissions in the work zone environment, product, raw material storage area is regularly monitored by PA and also through external approved lab and data are submitted to the concerned authorities. The fugitive emissions levels are within the limit as per the report. The PA have installed dust extraction system in the coal crushing area to prevent fugitive emissions.
(vii)	The Ambient Noise Level will be within 45-50dB(A)	Complied. The PA monitoring noise levels at different locations during day and night time and the levels are within the limit.
(viii)	The vent gases from Chlorine absorber of Sodium Hydro Chlorite Plant and a HCl plant shall be controlled at source by effective absorption system so that Chlorine concentration in the vent gases shall be discharged from the stacks of adequate height for effective dispersion. A close circuit high capacity emergency scrubbing system for Chlorine storage shall also be installed. All vents of HCl storage tank and loading area shall be connected to the scrubbing system.	Complied. The PA have installed 3 stages effective scrubbing system for Cl ₂ absorption. Tail gas tower scrubbing followed by water scrubbers are installed for HCl emissions from the HCl plant. They have also connected all vents of HCl storage tanks and loading tanks to water scrubbing system. Further they have also installed closed circuit high capacity scrubbing system for Cl ₂ storage and Cl ₂ filling section.
(ix)	Chlorine sensors shall be provided at liquid chlorine storage area, vent pipes of Sodium Hypo-plant, electrolysis area and HCl manufacturing unit with inter locking facility to automatically start scrubbing system whenever chlorine in storage area is more than 5 ppm. On-line Hydrogen and Chlorine analyzer shall also be installed.	Complied. They have installed Cl ₂ sensors at Cl ₂ storage, Sodium Hypo tower vent, electrolysis area, HCl area with inter locking facility to automatically start scrubbing system whenever chlorine in storage area is more than 5 ppm. On-line Hydrogen and Chlorine analyzer are also installed as informed.



(x)	Flame arresters shall be provided to arrest Hydrogen generated.	Complied. Flame arrestors are provided for all Hydrogen venting stacks.
(xi)	Water consumption shall not exceed 11, 266, 65 m ³ /day which will be met from Tungabhadra River.	Complied. As informed the water consumption is within 11, 266, 65 m ³ /day and the actual consumption is about 6000 m ³ /day.
(xii)	Waste water generation shall not exceed 780 m ³ /day of trade effluent and 115 m ³ /day of domestic effluent which shall be treated in the ETP. The treated water shall be used for On-land irrigation. Reverse osmosis and effluent from chelating tower regeneration shall be used for Brine make-up.	Complied. The main waste water generation is cooling water blow down. As informed the existing waste water generation is much less than 780m ³ /day (actual generation is 490m ³ /day) a The domestic waste water (now 80m ³ /day) is treated in the sewage treatment plant and treated sewage is used for green belt development in their company's land. Rejects from R.O. and chelating towers are used for brine make-up.
(xiii)	The sludge generated shall not exceed 8.0 TPD of Brine sludge which shall be disposed off in the secured land fill within the premises. ETP sludge shall also be sent to the secured landfill within the plant site. The landfill shall be as per the CPCB guidelines and approved by the state pollution control board. Requisite authorization shall be obtained under the Hazardous wastes (Management and Handling) Rules, 1989,as amended. Alternatively, treatment of Brine sludge with Citric Acid shall be carried out to use the neutralized sludge as manure. Barium Sulphate recovered from the sludge shall be sold as by product. Sludge from Potash stream shall be used as nutrient. The waste oil and used batteries shall be sold to authorized recyclers. Ash from boilers shall be sent to Brick manufacturers, Spent Nickel and Earth shall be sold to authorized recyclers.	Complied. Brine sludge generation from the additional capacities for which environmental clearance obtained is less than 8.0 TPD on dry basis. The same is disposed off in secured landfill within the company premises. ETP sludge generated is also disposed in secured landfill. The landfill is constructed as per the CPCB guidelines and approval also obtained by A.P. Pollution Control Board. One land fill was capped as per CPCB guidelines and the second pit is in use. Barium Sulphate is recovered and sold as a product. Sludge generated from Potassium chloride purification is used as a manure for greenbelt development. Used batteries and waste oil are sold to authorized recyclers. Ash generated from boiler is sold to brick manufacturers and cement industries. Spent catalyst, spent earth is sold to authorized recyclers/ manufacturers. The PA informed that since they are having membrane technology instead of mercury technology, the brine sludge generated is exempted from Hazardous wastes category from April 2016 onwards.

(xiv)	The Company shall comply with the recommendation made in Risk Assessment report and shall update the existing Disaster Management Plan.	Complied. The PA informed that the company is implementing all the recommendations made in Risk Assessment report and also updated the Disaster Management plan in 2015. Mock drill is conducted regularly.
(xv)	91.17 ha of the total area shall be developed as green belt as per the CPCB guidelines and in consultation with DFO.	Complied. The PA have developed greenbelt in 97 ha. in consultation with DFO. The plantation work and survival are good.
(xvi)	Responses to issues raised during Public Hearing shall be implemented by the Company.	Complied. The PA informed that the issues raised in public hearing were implemented.
(xvii)	The project authorities shall earmark Rs. 4.6 Crores and adequate recurring funds to implement the environmental protection measures and conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.	Complied. The PA informed that an adequate amount (Rs.5 crore) was earmarked for environmental protection measures and this amount will not be diverted for other purposes.

B. GENERAL CONDITIONS

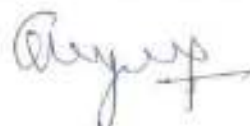
S.No.	Conditions	Compliance
I	The Project authorities shall strictly adhere to the stipulations made by the State Pollution Control Board.	Complied. The PA informed that all stipulations made by SPCB adhered and the consents are valid up to 28.2.2021.
II	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied. No expansion was carried out without prior approval of the Ministry of Environment and Forests. Now they are going for an expansion and for this only they have requested a certified compliance report. The details of proposed expansion is enclosed as Annex.1
III	At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.	Complied. The PA informed that at no time, the emissions levels has gone beyond the prescribed limits. They assured that in the event of failure of any pollution control system adopted by the unit, the unit will be immediately put out of operation and will not be restarted until the desired efficiency has been achieved.



IV	The project authorities shall strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous waste (Management and Handling) Rules, 1989 as amended in 2003, authorization from the SPCB shall be obtained for collection, treatment, storage and disposal of hazardous wastes.	Complied. The PA complying with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000. They have obtained authorization from the SPCB for collection, treatment, storage and disposal of hazardous wastes and it is valid upto Feb.2021.
V	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc., on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under environment (Protection) Act, 1986 Rules, 1989 viz., 75 dBA (day time) and 70 dBA (night time)	Complied. Noise control measures such as acoustic hoods, silencers, enclosures etc., has been provided on all sources of noise generation. The noise levels are monitored at several locations during night and day time and the levels are within the limits.
VI	Occupational Health surveillance programme should be undertaken as regular exercise for all the employees, specifically for those engaged in handling hazardous substances. The first aid facilities in the occupational health center should be strengthened and the medical records of each employee should be maintained separately.	Complied. Occupational health surveillance programme is carried out for all the employees who are working in Chlorine handling area, Turbine operating area and the records are maintained.
VII	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis.	Complied. Training is being imparted to all employees on safety and health aspects on chemicals handling. Pre-employment and periodical medical examinations are being conducted for all employees on regular basis.
VIII	Usage of PPEs by all employees/Workers shall be ensured.	Complied. The PA have provided PPE such as shoes, helmet and uniform to all employees. Safety dept., is monitoring the usage of PPEs by employees.
IX	The company shall strictly follow all the recommendations mentioned in the Charter in Corporate Responsibility for Environmental Protection (CREP)	Complied. The PA informed that the recommendations mentioned in the Charter in Corporate Responsibility for Environmental Protection (CREP) are implemented.
X	The company shall harvest surface well as rainwater from the rooftops of the	Complied. The PA have provided rain water




	buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.	harvesting measures for the rooftops of the buildings constructed in the expansion. Storm water drain to recharge the ground also has been made.
XI	The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report. All the recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented.	Complied. The PA implementing all the environmental protection measures proposed in the EIA/EMP report and also recommendations made in environmental management and risk mitigation measures relating to the project.
XII	The company will undertake all relevant measures, as indicated during the Public Hearing for improving the socio-economic conditions of the surrounding area CSR activities will be under taken by involving local villages and administration.	Complied. The PA informed that all relevant measures, as indicated in Public Hearing for improving the socio-economic conditions of the surrounding villages, CSR activities in consultation with local administration has been undertaken.
XIII	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval.	Complied The PA informed that the eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment has been undertaken and also informed that the eco-development plan was submitted to the SPCB for approval.
XIV	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Complied. A separate Environmental Management Cell has been set up with full fledged laboratory to carry out the Environmental Management and Monitoring functions.
XV	The implementation of the project vis-d-vis environmental action plans shall be monitored by the concerned Regional office of the Ministry/SPCB/CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.	Complied. The PA regularly submitting a six monthly compliance status report to Regional offices MoEF/SPCB/CPCB and also posted on the website of the Company.
XVI	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB / Committee and may also be seen at website of the Ministry	Complied. The PA had given an advertisement in two local newspapers (Eenadu and Hindu) and submitted the copy of the same to RO.



	at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	
XVII	The project authorities shall inform the Regional Office as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Complied. The PA informed that the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project were intimated to the Ministry and the RO.
6	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed to comply.
7	The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.	Agreed to comply.
8	The above conditions will be enforced, inter-alia under the provisions of the water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and Rules.	Agreed to comply.

This has the approval of the Addl.PCCF(C) vide diary no.1279 dt 28.09.2016.


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PRODUCTION CAPACITY

Amos: I
TGV

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant based on membrane cell process					
1	Caustic Soda Lye (Or) Flakes	TPD	520	500	1020
	Potassium Hydroxide Lye (Or) Flakes (100 % basis)				
2	Hydrochloric Acid (100%)	TPD	173	140	313
3	Liquid Chlorine	TPD	300	300	600
4	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
5	Barium Sulphate	TPD	5	5	10
6	Potassium carbonate	TPD	50	-	50
7	Sodium Sulphate	TPD	-	10	10
II. Chloromethanes					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Carbon tetrachloride	TPD	7.6	7.6	15.2*
5	Hydrochloric Acid (100 %)	TPD	23.5	23.5	47
III. Chlorodifluoromethane					
1	Chlorodifluoromethane (R22)	TPD	-	10	10
IV. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	-	76
2	Power generation Furnace Oil (31 MW - Standby)	MW			

*CCl₄ will be sold as a feed stack to Authorized users/ excess will be incinerated.

➤ ALSO MANUFACTURES NON EC PRODUCTS IN OIL AND FATS DIVISION

Utilities

S. No.	Utility	Permitted	Proposed	After Expansion
1.	Coal Fired Boilers (TPH)	1 x 45 1 x 100 1 x 110		1 x 45 1 x 100 1 x 110
2.	DG Sets (KVA)*	1 x 160 1 x 285 1 x 400 1 x 500	1 x 500	1 x 160 1 x 285 1 x 400 1 x 500 1 x 500
3.	Incinerator (kg/hr)	1 x 383	-	1 x 383

*DG sets will be used during load shut down by APTRANCO.

F. No. J-11011/619/2009 - IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi - 110 003

E-mail : pb.rastogi@nic.in

Telefax : 011: 2436 7668

Dated 14th February, 2012

To, ✓

Shri Jeswanth Reddym
Sr. Vice President & Factory Manager.
M/s Sree Rayalaseema Alkalies and Allied Chemicals Ltd.
Village Gondiparla, Mandal Kurnool,
District Kurnoor, Andhra Pradesh

E-mail : sraaclab@rediffmail.com ; Fax : 08518-280098.

Subject: Expansion by adding Chloromethanes Plant at Sy. No. 61, 62 B, 63 Village Gondiparla, Mandal Kurnool, District Kurnool, Andhra Pradesh by M/s Sree Rayalaseema Alkalies and Allied Chemicals Ltd. – Environmental Clearance reg.

Ref. : Your letter no. SRAAC/CMS/QAD/3 dated 2nd November, 2010.

Sir,

Kindly refer your letter dated 2nd November, 2010 alongwith project documents including Form I, Terms of References, Pre-feasibility Report, EIA/EMP Report and subsequent communications vide your letters dated 20th September, 2011 regarding above mentioned subject.

2.0 The Ministry of Environment and Forests has examined the application. It is noted that the proposal is for expansion by adding Chloromethanes Plant at Sy. No. 61, 62 B, 63 Village Gondiparla, Mandal Kurnool, District Kurnool, Andhra Pradesh. Tungabhadra River is located at 1.5 Km. Project cost is Rs. 97.9 Crores. Total land available is 305 acres. Gadidmadugu reserve forest is located at 5.5 Km. No ecological sensitive area is located within 10 km from the plant site. Following products will be manufactured:

S. N.	Products	Production (TPD)
1	Methyl Chloride	0.45
2	Methylene Chloride	61
3	Chloroform	56
By products:		
1	Carbon Tetrachloride (as a waste gas)	7.6 (to be incinerated)
2	Hydrochloric acid	23.5

3.0 HCl emissions from the chloromethane process will be scrubbed. Carbon tetra chloride gas produced from the process will be incinerated. Total fresh water requirement from Tungabhadra River source will be increased from 9,766.65 m³/day to 10,606.65 m³/day after expansion. Wastewater will be segregated into three effluent streams (i.e. castor oil & sewage; caustic soda plant and CPP) and treated in the effluent treatment plant (ETP). ✓

Treated effluent will be recycled/reused within the factory premises. Silica gel and calcium chloride will be sent to the existing captive secured landfill site. Boiler ash will be sold to cement manufacturers.

4.0 Public hearing of the project was exempted as per 7 (ii) of EIA Notification, 2006.

5.0 All synthetic organic chemical industries located outside the notified industrial estate/area are listed at S.N. 5(f) under category 'A' and appraised at Central level.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 6th, 18th and 28th meetings held during 14th December, 2009, 20th-21st January, 2011 and 20th- 21st October, 2011 respectively. The Committee recommended the proposal for environmental clearance.

7.0 Based on the information submitted by the project proponent, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006, subject to the compliance of the following Specific and General Conditions:

A. SPECIFIC CONDITIONS:

- i) All the specific conditions and general conditions specified in the earlier environmental clearance letter accorded vide Ministry's letter no. 11011/653/2007-IA-II dated 26th December, 2007 shall be implemented.
- ii) National Emission Standards for Organic Chemicals Manufacturing Industry issued by the Ministry vide G.S.R. 608(E) dated 21st July, 2010 and amended time to time shall be followed by the unit.
- iii) Instead of the earlier proposal of having the different section of the proposed Chloromethanes plant in 3 different locations, the complete plant of chloromethane shall be installed at one location in the adjacent site measuring about 4 acres.
- iv) Production of chloromethane shall start only after the incinerator is ready for incineration of Carbon tetra chloride gas.
- v) As proposed, HCl emissions from the chloromethane shall be absorbed in demineralised (DM) water in graphite absorption column to produce HCl (30%). After recovery of HCl, tail gases shall be passed through water scrubber to absorb the traces of HCl. Concentrated acid to be sold as by product.
- vi) The gaseous emissions (SO₂, NO_x, Cl₂ and HCl) and particulate matter from process stack shall conform to the norms prescribed by the CPCB/ APPCB from time to time. At no time, the emission levels shall go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly.
- vii) All necessary steps shall be taken for monitoring of chlorine as well as VOCs in the new plant. ✓

- viii) Carbon tetra chloride produced as waste gas shall be incinerated in an incinerator.
- ix) As proposed, steam requirement shall be met from existing co-generation unit.
- x) Ambient air quality data shall be collected as per NAAQES standards notified by the Ministry vide G.S.R. No. 826(E) dated 16th September, 2009. The levels of PM_{2.5}, SO₂, NO_x, CO, Cl₂, HCl, HC and VOCs shall be monitored in the ambient air and displayed at a convenient location near the main gate of the company and at important public places. The company shall upload the results of monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional office of MOEF, the respective Zonal office of CPCB and the AP Pollution Control Board (APPCB).
- xi) In plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Fugitive emissions shall be controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system shall be provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored. The emissions shall conform to the limits stipulated by the APPCB.
- xii) For further control of fugitive emissions, following steps shall be followed :
1. Closed handling system shall be provided for chemicals.
 2. Reflux condenser shall be provided over reactor.
 3. System of leak detection and repair of pump/pipeline based on preventive maintenance.
 4. The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.
 5. Cathodic protection shall be provided to the underground solvent storage tanks.
- xiii) The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.
- xiv) Incinerator alongwith its pollution control device shall be designed as per CPCB guidelines. After installation of incinerator, a performance evaluation study shall be carried out and report shall be submitted to the respective regional office of the Ministry, CPCB and APPCB.
- xv) Total fresh water requirement from Tungabhadra River source after expansion shall not exceed 10,606.65 m³/day and prior permission shall be obtained from the concerned authority. A copy of permission shall be submitted to the Ministry's Regional Office at Bangalore. No ground water shall be used.
- xvi) As proposed wastewater shall be segregated into three effluent streams (i.e. castor oil & sewage; caustic soda plant and CPP) and treated in effluent treatment plant. Treated effluent shall be recycled/reused within the factory premises. Performance evaluation study of the existing ETP shall be carried out and report shall be submitted to the respective region office of the ministry and

CPCB. Treated effluent shall be collected in the guard pond. Regular water quality monitoring of guard pond shall be carried out.

- xvii) Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through dedicated guard pond.
- xviii) As proposed, silica gel and calcium chloride shall be sent to the captive secured landfill site.
- xix) Captive secured landfill site shall be designed as per CPCB guidelines. A performance evaluation study for the existing captive secured landfill site shall be carried out and report shall be submitted to the respective regional office of the MoEF, CPCB and APPCB within three months. All the recommendations made in the study shall be implemented.
- xx) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All Transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.
- xxi) Piezometer wells shall be installed around secured landfill. Ground water monitoring shall be carried out in every three months and trend analysis shall be carried out and report shall be sent to the CPCB and APPCB.
- xxii) As proposed, no storage of fly ash shall be done at site and fly ash shall be directly transferred from the silo in a well designed covered trucks.
- xxiii) Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 as amendment in 2003. Fly ash shall be provided to cement and brick manufacturers for further utilization. Bottom boiler ash shall be used for landfill of the low lying area and also permission from APPCB shall be obtained.
- xxiv) Rice husk storage shall be done in such a way that it does not get air borne or fly around due to wind. As proposed, rice husk & coal storage yard shall be properly covered.
- xxv) Dedicated parking facility for loading and unloading of material shall be provided in the factory premises. Unit shall develop and implement good traffic management system for their incoming and outgoing vehicles to avoid congestion on the public road.
- xxvi) Good sanitary facility shall be provided for truck drivers/workers.
- xxvii) As proposed, greenbelt shall be developed in 89.03 ha out of total land 152.40 ha. as per the CPCB guidelines. Time bound action plan shall be submitted to the Ministry and its respective Regional Office to achieve 89.03 ha. greenbelt within 5 years.
- xxviii) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling.
- xxix) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

- xxx) General housekeeping and cleanliness at the plant site shall be improved.
- xxxi) Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.

B. GENERAL CONDITIONS:

- i. The project authorities shall strictly adhere to the stipulations made by the A.P. Pollution Control Board.
- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- iii. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.
- iv. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- v. The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.
- vi. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.
- vii. Usage of Personnel Protection Equipments (PPEs) by all employees/ workers shall be ensured.
- viii. The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing relating to the project shall be implemented.

- ix. The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villages and administration.
- x. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.
- xi. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
- xii. The company shall earmark sufficient funds to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
- xiii. A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from who suggestions/ representations, if any, were received while processing the proposal.
- xiv. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the AP Pollution Control Board. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.
- xv. The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.
- xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
- xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. ~

9.0 The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.

10.0 The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 1989/2003/ 2008 and the Public Liability Insurance Act, 1991 alongwith their amendments and rules.


(Dr. P. B. Rastogi)
Director

Copy to:-

1. The Principal Secretary, Department of Environment, Forest, Science & Technology, Government of Andhra Pradesh, Hyderabad, A.P.
2. The Chief Conservator of Forests, Regional Office (Southern Zone, Bangalore) Kendriya Sadan, 4th Floor, E&F Wing, II Block Koramangala, Bangalore-560034.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, Andhra Pradesh Pollution Control Board, Paryavaran Bhawan, A-III, Industrial Estate, Sanath Nagar, Hyderabad - A.P.
5. Adviser, IA II(I), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard File/Monitoring File/Record File.


(Dr. P. B. Rastogi)
Director

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

By Speed Post

E-mail : sansom_2859@yahoo.co.in

Telefax : 011-24360488

No. J-11011/653/2007 - IA II (I)

Date: 26th December 2007

To,

M/s Shree Royalseema Alkalies and Allied Chemicals Ltd.

Gondiparla

Kurnool - 518 004

Andhra Pradesh

Subject: Expansion of Chemical Manufacturing Unit at Gondiparla, Kurnool, Andhra Pradesh by M/s Shree Royalseema Alkalies and Allied Chemicals Ltd.- Environmental Clearance regarding.

Sir,

This is with reference to your application No. SRAAC/GMQA-MOEF/07 dated 27th June 2007 seeking environmental clearance for the above-mentioned project.

2. The Ministry of Environment and Forests has examined the proposal. It is noted that the proposal is for expansion of Chlor Alkali production by adding 75 TPD of additional capacity and enhancement of Captive Power Plant from 45 MW to 76 MW at the existing location at Gondiparla Village, Kurnool Mandal in Kurnool District, Andhra Pradesh. Land area available is 123.8 ha out of which green belt of 91.17 ha is proposed. Tungabhadra River is at 1.6 Km from the site. No ecologically sensitive area exists within 10 km periphery of the Project Site. No endangered species of Flora and Fauna has been reported. The Project does not involve any R & R. The cost of the Projects is Rs. 90 Crores, out of which Rs. 4.6 Crores will be earmarked for environmental protection measures. The following are the existing and proposed capacity of various products and By-Products along with CPP-

S. No.	Product Name	Existing Capacity (TPD)	Proposed Expansion (TPD)	Capacity After Expansion (TPD)
Chloro- Alkali Plant				
1	Caustic Soda Lye	160	150	520
2	Caustic Soda Flakes	140		
3	Potassium Hydroxide	70		
4	Hydrochloric Acid (100 % HCl)	105	68	173
5	Liquid Chlorine	200	100	300



जहाँ है हरियाली।
वहाँ है खुशहाली।।

पर्यावरण भवन, सी.जी.ओ. कॉम्प्लेक्स, लोदी रोड, नई दिल्ली - 110 003
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI - 110 003

6	Sodium Hypochlorite (100%)	8	--	8
7	Barium Sulphate	5	--	5
8	Potassium Carbonate	10	40	50
Captive Power Plant				
1	Captive Power Plant (Coal Based)	45 MW	31 MW	76 W

3. 31 MW Furnace oil based DG Set will be kept as standby. Membrane Cell Technology shall be used and CPP will be based on coal. Vacuum de-chlorination will be used to recover Cl_2 in pure form. NaCl and Potassium Chloride are the main raw materials for Caustic Soda and Caustic Potash production. Common Salt shall be obtained from Company's own salt fields. 31 MW of Power from DG sets as standby shall remain unaltered. No additional storage area for HCl and Chlorine tonners is envisaged. The water requirement, after expansion will be 11266.65 m³/d which will be met from Tungabhadra River. The unit has obtained the permission to draw water from Tungabhadra River. Waste water generation will be 780 m³/day of trade effluent and 115 m³/day of domestic effluent which will be treated in ETP. The treated water shall be used for On- land irrigation. Rejects from Reverse Osmosis and effluent from chelating tower regeneration will be used for Brine make-up. 8.0 TPD of Brine sludge and ETP sludge shall be sent to secured landfill within plant premise. It is also proposed to treat the brine sludge with Citric Acid and to use the neutralized sludge as manure as it is rich in Potassium, Sodium and Phosphate. Barium Sulphate recovered from the sludge shall be sold as by-product. Sludge from Potash stream shall be used as nutrient. The waste oil and used batteries shall be sold to authorized recyclers. Ash from boilers shall be sent to brick manufactures. Spent Nickle and Earth shall be sold to authorized recyclers.

4. The project activity is listed at 4 (d) and is of 'A' Category in the Schedule of EIA Notification, 2006. The project was considered as per EIA Notification, 1994 as per Para 2.2.1 (i) (a) of the Interim Operation Guidelines dated 13th October 2006 issued by the Ministry. Public Hearing of the project was held on 15.06.2007.

5. Based on the information provided, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006 subject to the compliance of the following conditions:

A. SPECIFIC CONDITIONS:

- (i) Project shall be based on Membrane Cell Technology only.
- (ii) The gaseous emissions (SO_2 , NO_x , Cl_2 and HCl) and Particulate matter along with RSPM from various process units shall conform to the prescribed norms by the

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concerned authorities from time to time. At no time, the emission levels shall go beyond the stipulated standards. The stack height shall be as per the CPCB guidelines. In the event of failure of pollution control system(s) adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Further, the company shall interlock the production system with the pollution control devices.

- (iii) Low Sulphur and Low Ash Coal shall be used as Fuel for the Captive Power Plant.
- (iv) For the control of air emission from the Captive Power Plant, Electro Static Precipitator with a stack height of about 90 m shall be provided and SPM levels in the flue gas would be less than 50 mg / Nm³.
- (v) Regular monitoring of ambient air quality shall be carried out including HCl and Chlorine. The location of the existing ambient air quality monitoring stations shall be reviewed in consultation with the SPCB and additional stations shall be set up, if required. It will be ensured that at least one station is in the down-wind direction.
- (vi) The fugitive emissions in the work zone environment, product, raw material storage area shall be regularly monitored and data shall be submitted to the concerned authorities. The emissions shall be controlled and conform to the limits prescribed by the CPCB in future.
- (vii) The Ambient Noise Level will be within 45 - 50 dB (A).
- (viii) The vent gases from Chlorine absorber of Sodium Hydrochlorite Plant and HCl Plant shall be controlled at source by effective absorption system so that Chlorine concentration in the vent gases shall not exceed 5 ppm. The vent gases shall be discharged from the stacks of adequate height for effective dispersion. A close circuit high capacity emergency scrubbing system for Chlorine shall also be installed. All vents of HCl switched tank and loading area shall be connected to the scrubbing system.
- (ix) Chlorine sensors shall be provided at liquid Chlorine storage area, vent pipes of Sodium Hypo-Plant, Electrolysis area and HCl manufacturing unit with inter-locking facility to automatically start scrubbing system whenever Chlorine in storage area is more than 5 PPM. On-line Hydrogen and Chlorine analyzer shall also be installed.
- (x) Flame arresters shall be provided to arrest H₂ generated.
- (xi) Water consumption shall not exceed 11,266.65 m³/d which will be met from Tungabhadra River.

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- (xii) Waste water generation shall not exceed 780 m³/day of trade effluent and 115 m³/day of domestic effluent which shall be treated in the ETP. The treated water shall be used for On- land irrigation. Rejects from Reverse Osmosis and effluent from chelating tower regeneration shall be used for Brine make-up.
- (xiii) The sludge generated shall not exceed 8.0 TPD of Brine Sludge which shall be disposed off in the secured landfill within the premises. ETP sludge shall also be sent to the secured landfill within the plant site. The landfill shall be as per the CPCB guidelines and approved by the State Pollution Control Board. Requisite authorization shall be obtained under the Hazardous Wastes (Management and Handling) Rules, 1989, as amended. Alternatively, treatment of Brine sludge with Citric Acid shall be carried out to use the neutralized sludge as manure. Barium Sulphate recovered from the sludge shall be sold as by-product. Sludge from Potash stream shall be used as nutrient. The waste oil and used batteries shall be sold to authorized recyclers. Ash from boilers shall be sent to Brick Manufactures. Spent Nickle and Earth shall be sold to authorized recyclers.
- (xiv) The company shall comply with the recommendation made in Risk Assessment report and shall update the existing Disaster Management Plan.
- (xv) 91.17 ha of the total area shall be developed as green belt as per the CPCB guidelines and in consultation with DFO.
- (xvi) Responses to issues raised during Public Hearing shall be implemented by the Company.
- (xvii) The project authorities shall earmark Rs. 4.6 Crores and adequate recurring funds to implement the environmental protection measures and conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.

P. GENERAL CONDITIONS :

- i. The project authorities shall strictly adhere to the stipulations made by the State Pollution Control Board.
- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.



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- iii. At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.
- iv. The project authorities shall strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989 as amended in 2003. Authorization from the SPCB shall be obtained for collection, treatment, storage, and disposal of hazardous wastes.
- v. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz, 75 dBA (day time) and 70 dBA (night time).
- vi. Occupational Health surveillance programme should be undertaken as regular exercise for all the employees, specifically for those engaged in handling hazardous substances. The first aid facilities in the occupational health centre should be strengthened and the medical records of each employee should be maintained separately.
- vii. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis.
- viii. Usage of PPEs by all employees/ workers shall be ensured.
- ix. The company shall strictly follow all the recommendations mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).
- x. The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.
- xi. The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report. All the

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recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented.

- xii. The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local villages and administration
 - xiii. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval.
 - xiv. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
 - xv. The implementation of the project vis-à-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.
 - xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
 - xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
6. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
7. The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.



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8. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.



(Sanchita Jindal)
Additional Director

Copy to:

1. The Secretary, Department of Environment and Forests, Government of Andhra Pradesh, Secretariat, Hyderabad- 500 022, A.P.
2. The Chief Conservator of Forests, Regional Office (Southern Zone) , Ministry of Environment & Forests, Kendriya Sadan ,4th Floor , C& F Wing, 17 Main Road, II Block , Kormangla, Bangalore- 560 034, Karnataka.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, A.P. Pollution Control Board, Paryavaran Bhawan, A-3, Industrial Estate, Sanath Nagar, Hyderabad- 500 018, A.P.
5. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Guard File.
7. Monitoring File.
8. Record File.

(Sanchita Jindal)
Additional Director

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

5. ANNEXURES

**Project No. 0118-13-03
January 2018**

**Sree Rayalaseema Alkalies and Allied Chemicals Limited
Gondiparla Village, Kurnool District,
Andhra Pradesh – 518 004
Phone: +91 98480 79064
E-mail: sraaclabs@rediffmail.com**

**STUDIES AND DOCUMENTATION BY
TEAM Labs and Consultants
B-115-117 & 509, Annapurna Block,
Aditya Enclave, Ameerpet,
Hyderabad-500 038.
Phone: 040-23748 555/23748616,
Telefax: 040-23748666**

**SUBMITTED TO
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI**



ANDHRA PRADESH POLLUTION CONTROL BOARD

Paryavarana Bhavan, A-III, Industrial Estate,

Sanathnagar, Hyderabad-500 018

Phone : 040-23887500, Website : www.appcb.ap.nic.in

AUTO RENEWAL OF CONSENT AND AUTHORISATION ORDER FOR OPERATIONS

In response to your application dated 25.02.2016 for Auto Renewal of Consent for operation and Authorisation Order, the Board is hereby extending validity period of Consent and Authorisation order given under sections 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 and 21 of the Air (Prevention and Control of Pollution) Act, 1981 and Authorisation under Rule 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, issued vide Consent order No. APPCB/KNL/KNL/16332/CFO&HWA/HO/2014-6628 dt.26.02.2014 with valid upto 28.02.2016, for further period of 5 (FIVE) years i.e., upto 28.02.2021.

M.V.N. P. 4/3/16
For A.P. POLLUTION CONTROL BOARD

Dated: 04.03.2016

To

The Occupier

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd.,

Gondiparla (V),

Kurnool District - 518 004.



**RENEWAL OF CONSENT & AUTHORISATION ORDER
BY REGISTERED POST WITH ACKNOWLEDGEMENT DUE**

Consent Order No : APPCB/KNL/KNL/16332/CEO&HWA/HO/2014 **Date: 26.02.2014** **6628**

(Consent Order for Existing/New or altered discharge of sewage and/or trade effluents/outlet under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof, Operation of the plant under section 21/22 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation / Renewal of Authorisation under Rule 5 of the Hazardous Wastes (Management, Handling & Transboundary, Movement) Rules 2008 & Amendments thereof).

CONSENT is hereby granted under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974, under section 21/22 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof, and Authorisation under the provisions of HW (MH & TM) Rules, 2008 (hereinafter referred to as 'the Acts', 'the Rules') and amendments thereof and the rules and orders made there under to **M/s. Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparala Village, Kurnool Mandal, Kurnool District - 518 004 E_mail: sraaclab@rediffmail.com** (hereinafter referred to as 'the Applicant /Industry') and is authorized to operate the industrial plant to discharge the effluents from the outlets and the quantity of Emissions per hour from the chimneys, by operating pollution control equipment, as detailed below.

i) Out lets for discharge of effluents:

Outlet No.	Unit	Effluents in KLD	Quantity in KLD	Method of Treatment and Disposal
1	Chloro Alkali plant	Process and washings - 97.5 KLD Cooling tower blow down / chelating tower rejects / gland seal - 82.5 KLD	180	After treatment in ETP, on land for gardening.
		Domestic waste water after septic tank	85	
2	Castory oil / Fatty Acid plant	Process and washings - 50 KLD Cooling tower blow down / chelating tower rejects & Boiler blow down - 120 KLD	170	After treatment in ETP, on land for gardening.
3	Co -Gen. plant	Process and washings - 220 KLD, + Cooling tower blow down / chelating tower rejects / gland seal -150 KLD, + Boiler blow down / regeneration water - 50 KLD	420	After treatment in ETP, on land for gardening.
		DM plant for generation / RO rejects	330	Recycled back into the process for brine makeup.

Continued... p/2

ii)) Emissions from chimneys:

Chimney No.	Description of Chimney
1.	Attached to Oil / H ₂ fired Thermax boiler – 4 TPH
2.	Attached to Oil fired boiler – 3 TPD
3.	Attached to 4 x 3 TPH Waste heat recovery boiler attached to D.G set – 4 x 6.2MW
4.	Attached to Husk fired boiler – 12 TPH
5.	Attached to Oil fired AIEC boiler – 3 TPH
6.	Attached to Coal fired HLL boiler – 42 TPH
7.	Attached to Coal fire boiler – 100 TPH
8.	Attached to Salt furnace – 15 Lakh K.Cal./hr. - 2 Nos
9.	Attached to Thermopack unit – 20 Lakh K.Cal./hr.
10.	Attached to D.G sets - 500 KVA - 2Nos.
11.	Tail vents (Chlorine & HCl)

iii) APPCB/KNL/KNL/16332/CFO&HWA/HO/2014 HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 5 (4)] of Hazardous Wastes (Management, Handling & Transboundary, Movement) Rules 2008 & Amendments thereof.

M/s. Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparla, Kurnool District is hereby granted an authorisation to operate a facility for collection, reception, storage, transport and disposal of the following wastes with quantities as below:

• HAZARDOUS WASTES WITH DISPOSAL OPTION AS PER THE CFO ORDER DATED :

S.No	Name of the Hazardous waste	Stream	Quantity of Hazardous waste	Disposal Option
1.	Process (brine sludge)	16.2 of Schedule-I	16TPD	Dispose in the onsite secured land fill complying to CPCB guidelines.
2.	ETP (sludge)	34.3 of Schedule-I	68 TPA	TSDF, Dundigal, Rangareddy District for secured land filling*.
3.	Glycerin Pitch	5.2 of Schedule-I	10 TPD	Incineration in Furnace followed by Boiler at temp. above 1000 °C / authorized cement plants for co processing.

* The RO, Kurnool shall collect the samples of ETP sludge generated in the industry for comprehensive analysis to verify applicability of the HWM rules.

Continued. .. p/3

• **HAZARDOUS WASTES WITH RECYCLING OPTION:**

S.No	Name of the Hazardous waste	Stream	Quantity of Hazardous waste	Disposal Option
1.	Process (spent catalyst)	35.2 of Schedule-I	1.0 TPD	Should be sent back to the manufacturers for reprocessing / TSDF, Dundigal.
2.	Process (spent earth)	35.3 of Schedule-I	2.0 TPD	Authorized recyclers/preprocessors.
3.	Fatty acid pitch & residue	5.2 of Schedule-I	7.5 TPD	
4.	Furnace oil sludge	5.2 of Schedule-I	31.68 TPA	Incineration in Furnace followed by Boiler at temp. above 1000 °C / authorized cement plants for co processing.
5.	Waste oil	5.1 of Schedule-I	3.0 TPA	Authorized recyclers/preprocessors.

This consent order is valid for the manufacture of quantities of each product as mentioned below only.

S.No.	Product	Quantity in TPD
1	Caustic soda lye	520
2	Caustic soda flakes	
3	Potassium Hydroxide / Caustic soda	
4	Potassium Carbonate	50
5	Liquid chlorine	300
6	Hydrochloric Acid (100% C12 basis)	186
7	Barium sulphate	05
8	Sodium hypochloride (100% C12 basis)	10
9	Calcium Hypochlorite (100% C12 basis)	10
10	Calcium sulphate	02
11	Hydrogenated Castor oil	100
12	a) 12-Hydroxy Stearic Acid (or) b) Methyl 12-hydroxy stearate (or) c) Ricinolic Acid.	60
13	Dehydrated Castor Oil	10
14	NN BIS Amide	05
15	Bio - Diesel	10
16	a) Glycerine (crude) b) Glycerine refined	75
17	Distilled Fatty Acid	20
18	Stearic Acid	35
19	Sodium Sulphate	06
20	Soap Noodles	100
21	Toilet soaps & Bathing Bars	50
22	Captive power plant (D.G sets)	24.8 MW (4 x 6.2MW) (stand by)
23	Hydrogen	25,253 m ³ /day
24	Electricity (coal based)	45 MW (21 MW+ 24 MW)

This order is subject to the provisions of 'the Acts' and the Rules' and orders made thereunder and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

Continued... 9/4

This combined order of consent & Hazardous Waste Authorisation should be valid for a period ending with the 28th day of February 2016.

Sd/-
MEMBER SECRETARY

✓ To

M/s. Sree Rayalaseema Alkalies & Allied Chemicals Limited,
Gondiparla (V), Kurnool (M)
Kurnool District - 518 004

// T.C.F.B.O //


CHIEF ENVIRONMENTAL ENGINEER

SCHEDULE - A

1. The applicant shall make applications through online for renewal of Consent (under Water & Air Acts) and Authorisation under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts for obtaining Consent & HW Authorisation of the Board.
2. This order is issued in line with Board's CFE order dated 07.05.2008 & 03.12.2008. Concealing the factual data or submission of false information/ fabricated data and failure to comply with any of the conditions mentioned in this order may result in withdrawal of this order and attract action under the provisions of relevant pollution control Acts.
3. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to such authority (hereinafter referred to as the Appellate Authority) constituted under Section 28 of the Water (Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.
4. The facility may explore the possibility of tapping the solar energy for their energy requirements.
5. All other conditions stipulated in the Schedule - A of the earlier combined CFO & HWA order No :APPCB/KNL/KNL/231/HO/CFO/2011-2301, dated 25.10.2011 remains same. The industry should ensure consistent compliance of the condition of Schedule-A.
6. The industry shall comply with the all the directions issued by the Board from time to time.
7. The Board reserves its right to modify above conditions or stipulate any further conditions and to take action including revoke of this order in the interest of protection of public health and environment.

Continued... p/5

SCHEDULE - B

- The effluent discharged should not contain constituents in excess of the tolerance limits mentioned below.

Outlet	Parameter No.	Limiting Standards
1 to 3.	pH	5.50 - 9.00
	Total Suspended Solids (TSS at 103 - 105 °C)	200 mg/l
	Oil and Grease	10 mg/l
	Biochemical Oxygen Demand (BOD 3 at 27 °C)	100 mg/l
	Chemical Oxygen Demand (COD)	250 mg/l

- The industry should take steps to reduce water consumption to the extent possible and consumption should NOT exceed the quantities mentioned below:

S.No	Purpose	Chloro Alkali plant (in KLD)	Castory oil / Fatty Acid plant (in KLD)	Co - Gen plant (in KLD)
1.	Process & washings	342.5	85	--
2.	DM Water including DM Plant for regeneration water and filter back wash	387.5	--	360
3.	Pump gland cooling	60	10	--
4.	Cooling (makeup) / humidification / water spraying)	1050	210	6050
5.	Floor Washings	40	6	30
6.	Domestic	100	6	60
Total		1,980 KLD	317 KLD	6500 KLD

- The industry shall file the water cess returns in Form-I as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5th of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water cess as per the assessment orders as and when issued by Board. The industry shall provide separate water meters with necessary pipeline for assessing the quantity of water used for each of the purposes as per Cess Form-I.
- The emissions should not contain constituents in excess of the prescribed limits mentioned below.

Chimney No.	Parameter	Emission Standards
1 to 6	SPM	115 mg/Nm ³
7	SPM	100 mg/Nm ³
8	SPM	115 mg/Nm ³
	HCl mist	35 mg/Nm ³
	Chlorine	15 mg/Nm ³
9 & 10	SPM	115 mg/Nm ³
11	Tail vents (Chlorine & HCl)	The sniff Cl ₂ from different Cl ₂ handling sections is collected under suction and sent to Cl ₂ neutralization section. The Cl ₂ gas is scrubbed in dilute Sodium Hydroxide solution in two absorption towers to make sodium Hypo-chlorite. A closed circuit scrubbing system installed to take care of any accidental leakage from chlorine storage and filling area. Cl ₂ sensors are also provided at Cl ₂ handling section. Water scrubber is installed to scrub the tail gas vents of HCl plant

Continued... p/6

4. The industry should comply with emission limits for DG sets of capacity upto 800 KW as per the Notification G.S.R.520 (E), dated 01.07.2003 under the Environment (Protection) Amendment Rules, 2003 and G.S.R.448(E), dated 12.07.2004 under the Environment (Protection) Second Amendment Rules, 2004. In case of DG sets of capacity more than 800 KW should comply with emission limits as per the Notification G.S.R.489 (E), dated 09.07.2002 at serial no.96, under the Environment (Protection) Act, 1986.
5. The industry should comply with ambient air quality standards of PM₁₀ (Particulate Matter size less than 10µm) - 100 µg/ m³; PM_{2.5} (Particulate Matter size less than 2.5 µm) - 60 µg/ m³; SO₂ - 80 µg/ m³; NO_x - 80 µg/ m³, outside the factory premises at the periphery of the industry.
Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.B-29016/20/90/PCI-I, dated 18.11.2009
Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
Night time (10 PM to 6 AM) - 70 dB (A).
6. The industry should not produce beyond the permitted capacity as mentioned in this order, without obtaining prior CFE & CFO of the Board.
7. The industry should maintain continuous monitoring equipment to air pollution control equipment and connect the data to APPCB website within one month and report the compliance to RO, Kurnool, as committed vide Ir.dt.02.12.2013.
8. The industry shall store Coal, Husk and Husk-ash in closed sheds only, as committed.
9. The industry shall provide continuous temperature recorder with recording facility for recording temperature of Furnace provided for incineration of Glycerin pitch, within one month and maintain records. They shall submit compliance report to the RO, Kurnool.
10. The industry shall provide pumping facility to transfer the leachate of landfill to ETP for treatment and disposal, within a month.
11. The industry shall earmark an amount of Rs. 1.29 Crores per annum (i.e, 0.2 % of project cost) for 10 years towards the Enterprise Social Responsibility (ESR) activities and spend the amount in Local area.
12. The industry shall conduct HAZOP studies & HAZID studies within 3 months and submit report to the Board.
13. The Expert committee will study the issue of transferring waste stored in the pits to the newly constructed landfill. The industry shall comply with the recommendations of the committee.
14. The industry should provide & maintain piezometric wells around the existing and new landfill site. Proper records shall be maintained.
15. The industry should store the raw materials in closed sheds only.
16. The industry is permitted to store treated waste water in guard ponds during rainy season / unavoidable circumstances only. The guard pond should be have proper lining away from river Tungabhadra towards Northern direction.
17. The industry should install chlorine sensors near cylinder storage and filling sections.
18. The industry should regularly carry out ground water quality monitoring around the landfill and submit the reports every months to RO, Kurnool.
19. The wastewater generation for tonne of Caustic soda produced should not exceed more than 1 m³ (Excluding cooling tower blow down).
20. Thick green belt should be developed & maintained by the industry with tall growing trees in the vacant spaces of the unit as per the norms.
21. The industry should establish appropriate Rain Water Harvesting structure on the available up-stream portion of the plant site.
22. The industry should provide separate water meters with necessary pipeline for assessing the quantity of water used for each of the purposes mentioned below.
 - a. Industrial cooling, boiler feed.
 - b. Domestic purposes.
 - c. Processing, whereby water gets polluted and pollutants are easily biodegradable.
 - d. Processing, whereby water gets polluted and pollutants are not easily biodegradable.

Continued... p/7

23. The applicant should submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.

SCHEDULE - C

[see rule 5(4)]

[CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]

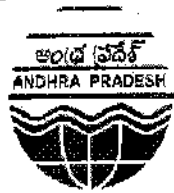
1. The industry shall give top priority for waste minimization and cleaner production practices.
2. The industry shall not store hazardous waste for more than 90 days as per the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and amendments thereof. The industry shall maintain 6 copy manifest system for transportation of waste generated and copies of receipt of Consignee shall be submitted to the Concerned Regional office. The industry shall maintain proper records for Hazardous Wastes stated in Authorisation in FORM-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form- 4 as per Rule 22(2) of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and amendments thereof.
3. The industry shall dispose /sell the Hazardous Waste to only industries/agencies authorized by the State Pollution Control Boards. The industry shall verify the authorization of the Board given to the Party before disposing its waste to the External Party.
4. The industry shall maintain proper records for Hazardous Wastes disposal and its concurrence with authorization. In case of variation in generation, industry shall submit explanation and obtain amendment in Environmental Clearance/ CFE/CFO in this regard.
5. The industry shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal. Waste oils shall be disposed to the authorized Reprocessors/ Recyclers and Used Lead Acid Batteries shall be disposed to the manufacturers / dealers on buyback basis. The industry shall take necessary practical steps for prevention of oil spillages and carry over of oil from the premises. The industry shall check the Certificate/ Authorisation/order of MoEF issued to the Re-user/Recycle units while disposing the waste oil.
6. The industry shall dispose of e-waste to the authorised recyclers only.
7. The industry shall maintain good house keeping.
8. The industry shall submit the condition wise compliance report of the conditions stipulated in Schedule B & C of this Order on half yearly basis to Board Office, Hyderabad and concerned Regional Office.

Sd/-
MEMBER SECRETARY

✓ To
M/s. Sree Rayalaseema Alkalies & Allied Chemicals Limited,
Gondiparla (V), Kurnool (M),
Kurnool District - 518 004.

// T.C.F.B.O //


CHIEF ENVIRONMENTAL ENGINEER



ANDHRA PRADESH POLLUTION CONTROL BOARD

Paryavarana Bhavan, A-III, Industrial Estate,

Sanathnagar, Hyderabad - 500 018.

Phone : 040-23887500, Website: www.appcb.ap.nic.in

AUTO RENEWAL OF CONSENT AND AUTHORISATION ORDER FOR OPERATIONS

In response to your application dated 18.05.2016 for Auto Renewal of Consent for Operation and Authorisation order, the Board is hereby extending validity period of Consent and Authorisation order given under Section 25/26 of Water (Prevention and Control of Pollution) Acts, 1974 and 21 of the Air Prevention and Control of Pollution) Acts, 1981 and Authorisation Rules 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 issued vide consent order No. APPCB /KNL/KNL /16332/ CFO&HWA/HO/2015 dated 28.10.2015 valid upto 31.08.2016 for further period of 5(five) years i.e., upto 31.08.2021.

All other conditions mentioned in Schedules A, B & C of the combined CFO&HWA order issued by the Board vide order dated 28.10.2015 will remain same.

The industry shall submit the compliance report to all the stipulated conditions for Consent for Operation for every six months i.e. on 1st of January and 1st of July of every year.

**Sd/-
MEMBER SECRETARY**

Dated: 06.06.2016

To
The Occupier,
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd.,
Sy. No.61, 62A, 62B, 63&64, Gondiparla (V),
Kurnool District - 518 004.
E-mail: sraaclab@rediffmail.com

Copy to:

1. The JCEE, Zonal Office: Kurnool for information and necessary action.
2. The JCEE (Cess),UH:II, APPCB, Hyderabad for information.
3. The JCEE (HWM),UH:IV, APPCB, Hyderabad for information.
4. The Environmental Engineer, Regional Office, Kurnool for information and necessary action.

//T.C.F.B.O//

16/6/16
JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head -IV)



**BY REGD. POST WITH ACKN. DUE
CONSENT & AUTHORISATION ORDER**

Consent Order No : APPCB/KNL/KNL/16332/CF&HWA/HO/2015-

Date : 28.10.2015

(Consent Order for Existing/New or altered discharge of sewage and/or trade effluents/outlet under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof, Operation of the plant under section 21 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation under Rule 5 of the Hazardous Wastes (Management, Handling & Transboundary, Movement) Rules 2008 & Amendments thereof.

CONSENT is hereby granted under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974, under section 21 of Air (Prevention & Control of Pollution) Act 1981 and Authorisation under the provisions of HW (MH & TM) Rules, 2008 (hereinafter referred to as 'the Acts', 'the Rules') and the rules and orders made thereunder to

M/s Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District.
E-mail: sraaclab@rediffmail.com

(Hereinafter referred to as 'the Applicant') authorizing to operate the industrial plant to discharge the effluents from the outlets and the quantity of emissions per hour from the chimneys as detailed below:

i) Out lets for discharge of effluents:

Outlet No.	Unit	Outlet Description	Max Daily Discharge in KLD	Point of Disposal
1	31 MW Power Plant	Boiler blow down & Cooling tower bleed off- 180 KLD + Washings DM plant & RO rejects - 75 KLD	255 KLD	Onland for gardening after treatment.
2	Chloro Methane plant	Cooling tower blow down & Scrubber blow down	57 KLD	Shall be treated in the existing ETP of Chloro alkali plant for further treatment and disposal. The treated waste water shall be further treated through UF & RO Plant. The RO rejects shall be recycled to Brine Plant and the RO Permeate shall be reused as process water.
3		Domestic	10 KLD	Septic tank followed by soak pit

ii) Emissions from chimneys:

Chimney No.	Description of Chimney
Power plant (31 MW)	
1	Stack attached to coal fired boiler of capacity - 110 TPH
Chloro methane plant	
2	Stack attached to LPG/Hydrogen gas fired incinerator of capacity - 343 Kgs/hr

III) HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 5 (4)]:

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, Sy.No. 61, 62A, 62B, 63 & 64, Gondiparla (V), Kurnool (M), Kurnool District is hereby granted an authorization to operate a facility for collection, reception, storage, treatment, transport and disposal of Hazardous Wastes namely:

• HAZARDOUS WASTES WITH DISPOSAL OPTION:

Sl. No.	Name of hazardous waste	Quantity	Stream	Disposal option
1.	Calcium Chloride	0.02 TPD	16.2 of Schedule-1	Shall be sent to secured land fill
2.	Silica gel	0.018 TPD	16.2 of Schedule-1	Shall be sent to secured land fill
3.	Bottom residue	0.50 TPD	20.3 of Schedule-1	Shall be incinerated along with Carbon Tetra Chloride in the incinerator.
4.	Carbon Tetra Chloride	7.5 TPD	16.2 of Schedule-1	Shall be incinerated in the onsite incinerator or shall be sold to Cypermethrine manufacturing units as a feed stock.
5.	Caustic scrubbing (Lean Brine)	7 KLD	34.1 of Schedule-1	Shall be sent for brine make up.

This consent is valid for manufacture of quantities of each product as mentioned below only.

Sl. No.	Products	Quantity
Chloro Methane Plant:		
1	Methyl Chloride	0.45 TPD
2	Methylene Chloride	61 TPD
3	Chloroform	56 TPD
By-Products		
4	CarbonTetrachloride (as waste gas)	7.6 TPD
5	Hydrochloric acid	23.5 TPD
Thermal Power Plant:		
6	Electricity	31 MW (From existing 45 MW (21+24 MW) Coal based to 76* MW)

***There shall not be any additional generation of Thermal Power . The existing 31 MW furnace oil gas based generator sets shall be kept as standby and the equivalent 31 MW shall be generated as coal based turbine.**

This order is subject to the provisions of 'the Acts' and the Rules' and orders made there under and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

This combined order of consent & Hazardous Waste Authorisation shall be valid for a period ending with the 31st day of August, 2016.

Sd/-
MEMBER SECRETARY

To
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District - 518 004.

//T.C.F.B.O//
[Signature]
28/10/15
JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head -IV)

SCHEDULE - A

1. The applicant shall make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts for obtaining Consent & HW Authorization of the Board.
2. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to such authority (hereinafter referred to as the Appellate Authority) as the State Government may think fit to constitute under Section 28 of the Water(Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air(Prevention and Control of Pollution) Act, 1981.
3. This order is issued in line with the Board's CFE order dt. 07.05.2008 & 10.04.2012. Concealing the factual data or submission of false information / fabricated data and failure to comply with any of the conditions mentioned in this order may result in withdrawal of this order and attracts action under the provisions of relevant pollution control Acts.
4. All the conditions stipulated in the Schedule - A of the earlier combined CFO & HWA order No: APPCB/KNL/KNL/231/HO/CFO/2013-2301 dt.25.10.2011 remains same. The industry should ensure consistent compliance of each condition of Schedule-A.

SCHEDULE - B

1. The industry shall take steps to reduce water consumption to the extent possible and consumption shall NOT exceed the quantities mentioned below:

S. No	Purpose	Chloro Methane plant(in KLD)	Power plant(in KLD)
1.	Boiler feed	-	640
2.	Cooling Tower makeup	800	1850
3.	Scrubber	20	-
4.	Fresh water for 32% HCl	20	-
5.	Domestic	10	-

3. Separate meters with necessary pipe-line shall be provided for Chloro Methane plant & Power plants for assessing the quantity of water used for boiler feed, cooling Tower makeup, Scrubber, Fresh water for 32% HCl and domestic.
4. The industry shall file the water Cess returns in Form-1 as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5th of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water Cess as per the assessment orders as and when issued by Board.
5. The effluent discharged shall not contain constituents in excess of the tolerance limits mentioned below.

Outlet No.	Parameter	Limiting Standards
1	P ^H	5.5 - 9.0
	Suspended Solids	200.0 mg/l
	Oil & Grease	10.0 mg/l
	Biochemical Oxygen Demand (BOD)	100.0 mg/l

6. The emissions shall not contain constituents in excess of the prescribed limits mentioned below:

Chimney No.	Parameter	Emission Standards	Sampling duration
1	Particulate matter	50 mg/Nm ³	for 30 hours
	Hcl	50 mg/Nm ³	for 30 hours
	SO ₂	200 mg/Nm ³	for 30 hours
	CO	100 mg/Nm ³	for 30 hours
		50 mg/Nm ³	for 24 hours
	Total Organic Carbon	20	for 30 hours
	HF	4	for 30 hours
	NO _x (NO and NO ₂ expressed as NO ₂)	400	for 30 hours
	Total dioxins and furans	0.1 ng TEQ/ Nm ³	for 8 hours
	Cd+Th+ their compounds	0.05 mg/Nm ³	for 2 hours
	Hg and its compounds	0.05 mg/Nm ³	for 2 hours
	Cd+As+Pb+Co+Cr+Cu+Mn+Ni+V+ their compounds	0.50	for 2 hours

7. The industry shall comply with ambient air quality standards of PM_{10} (Particulate Matter size less than $10 \mu m$) - $100 \mu g/m^3$; $PM_{2.5}$ (Particulate Matter size less than $2.5 \mu m$) - $60 \mu g/m^3$; SO_2 - $80 \mu g/m^3$; NO_x - $80 \mu g/m^3$, outside the factory premises at the periphery of the industry. Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.8-29016/20/90/PCI-I, dated 18.11.2009
Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
 Night time (10 PM to 6 AM) - 70 dB (A).
8. The industry shall not manufacture any product, other than those mentioned in this order, without CFE & CFO of the Board.
9. The industry shall not increase the capacity beyond the permitted capacity mentioned in this order, without obtaining CFE & CFO of the Board.
10. The industry shall install Online stack monitoring system for the stack attached to 110 TPH Boiler installed for 31 MW Power Plant within three months and connect the monitoring data to the web site of APPCB.
11. The industry shall connect the online monitoring data to the APPCB website immediately for the 2 No's of Online stack monitoring systems provided to 100 TPH & 42 TPH boilers in the power plant and also 2 Nos. of Online stack monitoring system in the Chloro Alkali Plant and submit the compliance to RO, Kurnool.
12. System of leak detection and repair of pump / pipeline shall be installed in the plant and immediate response team shall be identified for preventive maintenance.
13. The industry shall maintain the following records and the same shall be made available to the inspecting officers of the Board:
 - i. Daily production details, RG-I records and Central Excise Returns.
 - ii. Quantity of Effluents generated, treated and recycled.
 - iii. Log Books for pollution control systems.
14. The industry shall regularly operate Graphite Absorption column for absorption of HCl emissions generated from Chloro Methane plant to produce HCl with a concentration of 30%. The tail gases from the absorption column shall be further passed through water scrubber to absorb the traces of HCl.
15. The industry shall regularly operate the scrubber for scrubbing the flue gas emissions from the incinerator.
16. The industry shall not cause any air pollution / odour nuisance in the surrounding environment.
17. The industry shall further develop green belt in an area of 25 acres to achieve total green belt area of 220 acres as stipulated in the EC order dt. 14.02.2012.
18. The industry shall comply with the conditions stipulated in the Board's CFE order dt. 07.05.2008 & 10.04.2012.
19. The industry shall comply with the conditions stipulated in the EC order dated 26.12.2007 & 14.02.2012.
20. The proponent shall comply with all the directions issued by the Board vide order dt. 18.12.2014 & 24.02.2015.
21. The applicant shall submit Environment statement in Form V before 30th September of every year as per Rule No.14 of E (P) Rules, 1986 & amendments thereof.
22. The Board reserves its right to modify above conditions or stipulate any additional conditions including revocation of this order in the interest of environment protection.
23. The conditions stipulated are without prejudice to the rights and contentions of this Board in any Hon'ble Court of Law.

SCHEDULE - C
[see rule 5(4)]

[CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]

1. The industry shall give top priority for waste minimization and cleaner production practices.
2. The industry shall not store hazardous waste for more than 90 days as per the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and amendments thereof.
3. The industry shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal.
4. The industry shall not dispose Waste oils to the traders and the same shall be disposed to the authorized Reprocessors/ Recyclers.
5. The industry shall dispose Used Lead Acid Batteries to the manufacturers / dealers on buyback basis.
6. The industry shall take necessary practical steps for prevention of oil spillages and carry over of oil from the premises.
7. The industry shall maintain 6 copy manifest system for transportation of waste generated and a copy shall be submitted to Board Office and concerned Regional Office.

8. The industry shall maintain good house keeping & maintain proper records for Hazardous Wastes stated in Authorisation.
9. The industry shall maintain proper records for Hazardous Wastes stated in Authorisation in FORM-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form- 4 as per Rule 22(2) of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and amendments thereof.
10. The industry shall submit the condition wise compliance report of the conditions stipulated in Schedule A, B & C of this Order on half yearly basis to Board Office, Hyderabad and concerned Regional Office.
11. The industry shall dispose of e-waste to the authorised recyclers only.

Sd/-
MEMBER SECRETARY

To
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District.

//T.C.F.B.O//

K. Leo
28/10/15
JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head -IV)

**GOVERNMENT OF ANDHRA PRADESH
WATER RESOURCES(REFORMS) DEPARTMENT**

Memo.No.16570/Reforms/A2/2011

Dated:12.12.2016.

Sub: Water Resources Department: Request of M/s Sree Rayalaseema Alkalies & Allied Chemical Ltd. Kurnool for Addition: 8000 M³ of water per day from Tungabhadra River from the existing well located towards the northern bank of river. Permission Accorded - Orders issued - Reg.

- Ref:**
- 1) G.O.Ms.No.2, I&CAD(PW)CC&WS/COO/Deptt. dt.01.01.2004
 - 2) G.O.Ms.No.106, I&CAD(PW)CC&WS/COO/Deptt. dt.19.7.2003
 - 3) G.O.Ms.No.226, I&CAD(PW)Reforms/Deptt. dt.08.12.2005
 - 4) From the Executive Director (Tech) SRWC-IPR/11, dated 28.05.2011
 - 5) Govt. Memo. No. 16570/Reforms/A2/2011 I & CAD (PW) Deptt. dt.22.07.2011
 - 6) From the Engineer -in- Chief (Irrigation), I & CAD Deptt. Hyderabad Lr.No ENC(I)/DCE-W/OT TBD/AEE/68219/2011-12, dt.19.09.2011
 - 7) Govt. Memo. No. 16570/Reforms/A2/2011 I & CAD (PW) Deptt. dt.08.11.2011
 - 8) From the Engineer -in- Chief (Irrigation), I & CAD Deptt. Hyderabad Lr.No ENC(I)/DCE-W/OTTBD/AEE2/1625 dt.23.07.2012
 - 9) G.O.Ms.No.11, I&CAD(PW)Reforms/Deptt. dt.05.02.2014
 - 10) G.O.Ms.No.12, I&CAD(PW)Reforms/Deptt. dt.05.02.2014
 - 11) Govt. Memo. No. 16570/Reforms/A2/2011 I & CAD (PW) Reforms/ Deptt. dt.27.09.2012 & 24.09.2014
 - 12) From the Engineer -in- Chief (Irrigation), I & CAD Deptt. Hyderabad Lr.No ENC(I)/DCE GDS/OT 1/AEE2/1625 dt.07.10.2014
 - 13) G.O.Ms.No.57, Water Resources Reforms/Deptt. dt.29.05.2015
 - 14) G.O.Ms.No.58, Water Resources Reforms/Deptt. dt.29.05.2015
 - 15) WP-15545 & 15550, dt.2015 filed by Sree Rayalaseema Alkalies and Allied Chemicals Ltd Gondiparla, Kurnool
 - 16) Govt. Memo. No.2772/Reforms/A2/2015 dated 30.06.2015
 - 17) From Shri T.G Venkatesh Ex Minister for Minor Irrigation APS/DC Lift Irrigation APWRWS, Walammar & Ground water, Lr.No.184/2016 Dated 21.04.2016 Endt.No.264/Mn. IRR/2016 dt.20.05.2016
 - 18) From Shri T.G Venkatesh, MP, Raya Sathya Lr.No.184/2016 Dated 11.06.2016 Endt.No.677/M. Camp. IRR/2016 dt.18.06.2016
 - 19) From Shri T.G Venkatesh, MP, Raya Sathya Lr.No.264-Ex Min. IRR/2016 Dated 11.06.2016

In the reference 9th & 10th cited orders were issued in G.O.Ms.No.11 & CAD (PW) Reforms/Deptt. dated 05.02.2014 for renewal of drawl of 3000 M³ water per day for their factory from the Southern Bank of Tungabhadra River to M/s Sree Rayalaseema Alkalies and Allied Chemicals Limited at Gondiparla village of Kurnool Mandal, Kurnool District, and also issued orders for drawl of 8000 M³ (2505+ 5495) per day for their captive power plant vide G.O.Ms.No.12, I & CAD (PW) Reforms/Deptt. dated 05.02.2014 from Northern bank of Tungabhadra River to M/s Sree Rayalaseema Alkalies and Allied Chemicals Ltd at Gondiparla village of Kurnool district total in to 11000 M³ of water per day.

2. Subsequently, in the reference 13th & 14th cited Government have issued the revised orders duly revising the water royalty charges as Rs.5.50 / 1000 gallons instead of Rs.1.50/1000 gallons and Rs.4.50/1000 gallons in G.O.Ms.No. 57 & 58, Water Resources (Reforms) deptt. dt.29.5.2015.

(PTO)

3. In the reference 16th cited, Based on the G.O Ms.No. 202, Industries & Commerce (INF) Department dated 06.12.2014, the water Resources Department in Govt Memo.No 2772/Reforms/A2/2015- dated:30.09.2015, issued instructions to E N C(Irrigation) and all Chief Engineers concerned, after approval of SIPC/SLSWCC/DIPC, that the Chief Engineer concerned shall permit allocation of water for industrial use within 10% of reserved water for industrial purpose.

4. In the reference 17, 18, & 19th cited Sri T.G.Venkatesh, Member of Parliament (Rajya Sabha), in his letter dated 21.04.2016 & 11.06.2016 has requested the Government to consider the request of M/s Sree Rayalaseema Alkalies & Allied Chemical Limited, Kurnool for drawl of additional 9000 M³ of water per day from Tungabhadra River from the existing well located towards the Northern bank of river for the proposed 51 MW Coal based Power plant, 75 TPD Caustic Soda Plant, and 120 TPD Chloromethanes Plant of Sree Rayalaseema Alkalies and Allied Chemical Limited, Kurnool only. He has also requested for water royalty charges at the rate of Rs. 1.50/1000 gallons instead of Rs. 5.50/1000 gallons.

5. In the reference 6th & 12th cited, the Engineer-in-Chief (Irrigation), Hyderabad has reported that, the Chief Engineer (P), Kurnool vide his letter dated 08.08.2011 has reported that, there is no objection for grant of permission to draw additional of 9000 cum water per day subject to certain terms and conditions. And the Deputy Director, Ground Water Department, Kurnool has reported that, Commissioner, Municipal Corporation, Kurnool has reported that "Kurnool Corporation, as on today is not at all depending on ground water/infiltration wells of the Tungabhadra river and it is totally depending on surface water from Sunkesula Barrage (through K.C.Canal) which is located nearly 24 Km away from KMC Limits". Hence, the Engineer-in chief (Irrigation), Hyderabad has requested the Government, that the proposal for drawl of water for additional 9000 M³/ day by the firm can be examined & considered.

6. After careful examination of the above proposal, the Government hereby accord permission for drawl of additional 9000 M³ of water per day from Tungabhadra River from the existing well located towards the Northern bank of river for the proposed 51 MW Coal based Power plant 75 TPD Caustic Soda Plant, and 120 TPD Chloromethanes Plant of Sree Rayalaseema Alkalies and Allied Chemical Limited, only at usual terms and conditions.

7. In view of the above, the Engineer-in-Chief (Irrigation), Andhra Pradesh, Vijayawada has requested to take further necessary action accordingly as per the instructions issued vide Govt Memo. No.2772/ Reforms/ A2/ 2015 WR Deptt. dated 30.09.2015 at usual terms and conditions.

SHASHI BHUSHAN KUMAR
SECRETARY TO GOVERNMENT

To
The Engineer-in-Chief(Irrigation), Water Resources Department,
Irrigation Compound, Governorpet, Vijayawada
The Collector & District Magistrate, Kurnool
The Managing Director, A.P. Pollution Control Board, Hyderabad

Copy to:

The Chief Engineer (Projects) Irrigation, Kurnool
The Superintending Engineer, Irrigation Circle, Kurnool
The Commissioner of Industries, Vijayawada
The P.S. to Minister for Major & Medium Irrigation
M/s. Sree Rayalaseema Alkalies & Allied Chemical Limited,
Gondiparla(V), Kurnool District through E.N.C(Irrig), Vijayawada
SF/SC.

// FORWARDED BY ORDER //

M. Sudha Rao
SECTION OFFICER
24

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

I&CAD Deptt. - Renewal permission for drawl of water not exceeding 8000 M³ (2505+5495) per day from the Northern Bank of Tungabhadra River to M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited to operate 10 MW and 2x12 MW generation captive power plant for captive use at Gondiparla(V), Kurnool District for a further period of 10 years beyond 18.07.2013 - Accorded - Orders - Issued.

IRRIGATION & CAD (PW:REFORMS) DEPARTMENT

G.O.Ms.No.12.

Dated:05-02-2014.

READ the following:-

- 1) G.O.Ms.No.106, I&CAD(PW:QC&IWS/COD)Dept., dt:19.7.2003.
- 2) G.O.Ms.No.226, I&CAD(PW:Reforms) Deptt., dt:08.12.2005.
- 3) From M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd., Kurnool, Letter, dated:05.01.2013.
- 4) Govt.Memo.No.1282/Reforms/A2/2012, dt:16.1.2013.
- 5) From the E.N.C.(Irr.), Hyd., Lr.No.ENC(1)/DCE.1/OT.TBD/AEE2/1625, Dated:17.05.2013.
- 6) Govt.Memo.No.1282/Reforms/A1/2013-2, dt:06.08.2013.
- 7) From the E.N.C.(Irr.), Hyd., Lr.No.ENC(1)/DCE.1/OT.TBD/AEE2/1625, dated:19.11.2013.

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ORDER:

In the references 1st and 2nd read above, Government have permitted for release of 2505 M³ and 5495 M³ of water per day from a new well situated on Northern Bank of Tungabhadra River towards establishment of Multi fuel based Captive Power Plant at Gondiparla(V), Kurnool District by M/s. Sri Rayalaseema Alkalies and Allied Chemicals Limited for a period of Ten years, subject to following certain conditions mentioned therein.

2. In the references 5th and 7th read above, the Engineer-in-Chief(Irrigation), Hyderabad has submitted proposals for drawl of water by M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, Kurnool not exceeding 8000 M³ (2505+5495) per day from the Northern Bank of Tungabhadra River to operate 10 MW and 2x12 MW generation captive power plant for captive use at Gondiparla(V), Kurnool District for a further period of Ten years beyond 18.07.2013, subject to certain conditions mentioned therein.

3. Government after careful examination, hereby accord renewal permission for drawl of water not exceeding 8000 M³ (2505+5495) per day from the Northern Bank of Tungabhadra River to M/s. Sri Rayalaseema Alkalies and Allied Chemicals Limited to operate 10 MW and 2x12 MW generation captive power plant for captive use at Gondiparla(V), Kurnool District for a further period of Ten years beyond 18.07.2013 for consumptive use, subject to the concurrence of District Collector, Kurnool and the clearance of Pollution Control Board, subject to the following terms and conditions:-

- 1) The firm should take water to the plant from well situated at Northern bank of Tungabhadra river at their own cost.

P.T.O.,

- 2) Water meter or suitable measuring device should be installed by the firm to measure the water consumed and should be made available to the Executive Engineer in charge or his authorized representative at all times for inspection.
- 3) The firm should pay water charges at the rate as fixed by Government from time to time which is payable every month against the bills raised by the department, for the entire quantity of $2505 \text{ M}^3 + 5495 \text{ M}^3 = 8000 \text{ M}^3$.
- 4) The firm should make their own arrangements to dispose off the industrial effluent after treatment.
- 5) The beneficiary should not let out any effluent toxic or un acceptable outside their premises and the provision for effluent treatment should be made to the satisfaction of Andhra Pradesh Pollution Control Board.
- 6) The firm should not have any right to use surface water from Tungabhadra River and also not to make any obstruction to the free flow in Tungabhadra River.
- 7) The firm should obtain revised permission from Pollution Control Board immediately.
- 8) The water drawn from the canal should be utilized for the purpose for which permission is granted. Any misuse in this regard will entail cancellation of the permission without any notice & liable for imposition of penalty.
- 9) The entire cost of Infrastructure to draw water shall be borne by the industry only.
- 10) Water meters or suitably approved digital measuring devices should be installed by the industry at their own cost to measure the water consumed and water measuring devices should be kept under the control of Irrigation & CAD Department and the representatives of the user shall be present at all times for taking readings.
- 11) No field bodhi or pipeline shall be taken through or along the Government land without approval of Government and if permission is accorded by the Government, the lease of Government land should be paid as fixed by the Government only.
- 12) The industry should obtain the prior concurrence of concerned Department for laying pipeline and for crossing etc.
- 13) The industry should make their own arrangements for supplementation of water in their premises only.
- 14) The Irrigation & CAD Department reserves the right for cancellation of the permission without assigning any reasons thereof.
- 15) The Irrigation & CAD Department is no way responsible of non-supply / Non Availability of water due to any reasons in any particular water year and lean period i.e. from 1st January to 30th May.

- 16) The Industry must strengthen the canal margin 100 Mts. on either side of the proposed off take point to avoid slips, erosion of banks and to protect existing margins as directed by the Department.
- 17) The Industry should lay the pipeline duly leaving not less than 1.00 Mt. from the toe of the flood bank.
- 18) The industry has to construct CC walls to avoid leakages at pipe line crossings.
- 19) The industry should follow the Revenue Board Standing orders (B.S.O).
- 20) The industry should pay security deposit at 2.5% on 10 years water charges for which permission is granted.
- 21) The permission accorded shall be for a period of 10 years only. The permission shall have to be renewed well in advance before the expiry of the permission.
- 22) The Industry shall pay one year water charges as advance and amounts due to the Department before entering into renewal agreement.
- 23) The industry should make its own arrangements creating storage facilities for the requirement of water for the period from 1st January to 30th May in their premises only.
- 24) The present rate of royalty charges as per the G.O.Ms. No.39, 18/CAD(PW:QC&IWS/COD) Department, Dated:02-04-2002 is Rs.4.50 per 1000 gallons for consumptive use. The water royalty charges are likely to be revised by the Government from time to time and the industry shall pay the revised rates as fixed by the Government from time to time. Royalty charges should be paid every month and non-payment of royalty charges in any month should result in stoppage of water.
- 25) The firm has to pay the water charges for the estimated quantity in advance at the start of the Financial Year (i.e) before 10th April every year as per BSO.
- 26) The consumptive utilization of water 8000 M³ per day as required should not be exceeded under any circumstances.
- 27) A detailed plan showing the location, the intake arrangements, conveyance system etc., shall be furnished to the Department.
- 28) The industry shall abide any other conditions laid down by the Government/ Department from time to time.
- 29) The permission does not confer any riparian right to the industry.
- 30) Non adherence to any of the conditions by the industry entails cancellation of the permission.

P.T.O.,

4. The Engineer-in-Chief(Irrigation), Hyderabad shall take necessary action accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

B. ARAVINDA REDDY,
PRINCIPAL SECRETARY TO GOVERNMENT.

To

The Engineer-in-Chief(Irrigation), I&CAD Department,
Errum Munzil, Jalasouda Building, Hyderabad.

The Collector & District Magistrate, Kurnool.

The Managing Director, A.P. Pollution Control Board, Hyderabad.

Copy to:

The Chief Engineer(Projects), Irrigation, Kurnool.

The Superintending Engineer, Irrigation Circle, Kurnool.


The Commissioner of Industries, Hyderabad.

The O.S.D. to Minister for Major & Medium Irrigation.

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Gondiparla(V), Kurnool District through E.N.C.(Irr.), Hyd.

SF/SC.

//FORWARDED :: BY ORDER//


SECTION OFFICER.

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

I&CAD Deptt. - Renewal permission for drawl of water not exceeding 3000 M³ per day from the Southern Bank of Tungabhadra River to M/s.Sree Rayalaseema Alkalies and Allied Chemicals Limited at Gondiparla(V), Kurnool District for a further period of 10 years beyond 06.12.2013 - Accorded - Orders - Issued.

IRRIGATION & CAD (PW:REFORMS) DEPARTMENT

G.O.Ms.No.11.

Dated:05-02-2014.

READ the following:-

- 1) G.O.Ms.No.02, I&CAD(PW:QC&IWS/COD) Deptt., dt:1.1.2004.
- 2) From M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd., Kurnool, Letter, dated:05.01.2013.
- 3) Govt.Memo.No.1281/Reforms/A2/2012, dt:17.1.2013.
- 4) From the E.N.C.(Irr.), Hyd., Lr.No.ENC(1)/DCE.I/OT.TBD/AEE2/68219/2012-13/Vol.III, Dated:08.05.2013.
- 5) Govt.Memo.No.1281/Reforms/A1/2013-2, dt:06.08.2013.
- 6) From the E.N.C.(Irr.), Hyd., Lr.No.ENC(1)/DCE.I/OT.TBD/AEE2/68219/2013-14, dated:19.11.2013.

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ORDER:

In the reference 1st read above, Government have permitted M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, Kurnool to draw water not exceeding 3000 M³ per day from the Southern Bank of Tungabhadra River to their factory at Gondiparla(V) of Kurnool Mandal, Kurnool District for a period of Ten years beyond 06.12.2003 subject to payment of water charges @ Rs.1.50Ps/1000 gallons, subject to obtaining permission from A.P. Pollution Control Board.

2. In the references 4th and 6th read above, the Engineer-in-Chief(Irrigation), Hyderabad has submitted proposals for drawal of water by M/s.Sree Rayalaseema Alkalies and Allied Chemicals Limited, Kurnool not exceeding 3000 M³ per day from the Southern Bank of Tungabhadra River to their factory at Gondiparla(V) of Kurnool Mandal, Kurnool District for a further period of Ten years beyond 06.12.2013, subject to certain conditions mentioned therein.

3. Government after careful examination, hereby accord renewal permission for drawl of water not exceeding 3000 M³ per day from the Southern Bank of Tungabhadra River to M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited for their factory at Gondiparla(V) of Kurnool Mandal, Kurnool District for a further period of Ten years beyond 06.12.2013 for consumptive use, subject to the concurrence of District Collector, Kurnool and the clearance of Pollution Control Board, subject to the following terms and conditions:-

- 1) The firm should take water to the plant from the well situated at Southern bank of Tungabhadra river at their own cost.
- 2) Water meter or suitable measuring device should be installed by the firm to measure the water consumed and should be made available to the Executive Engineer in charge or his authorized representative at all times for inspection.

P.T.O.,

- 3) The firm should pay water charges at the rate as fixed by Government from time to time, which is payable every month against the bills raised by the department.
- 4) The firm should make their own arrangements to dispose off the industrial effluent after treatment.
- 5) The beneficiary should not let out any effluent toxic or un-acceptable outside their premises and the provision for effluent treatment should be made to the satisfaction of Andhra Pradesh Pollution Control Board.
- 6) The firm should not have any right to use surface water from Tungabhadra River and also not to make any obstruction to the free flow in Tungabhadra River.
- 7) The firm should obtain revised permission from Pollution Control Board immediately.
- 8) The water drawn should be utilized for the purpose for which permission is granted. Any misuse in this regard will entail cancellation of the permission without any notice & liable for imposition of penalty.
- 9) The entire cost of Infrastructure to draw water shall be borne by the industry only.
- 10) Water meters or suitably approved digital measuring devices should be installed by the industry at their own cost to measure the water consumed and water measuring devices should be kept under the control of Irrigation & CAD Department and the representatives of the user shall be present at all times for taking readings.
- 11) No field bodhi or pipeline shall be taken through or along the Government land without approval of Government and if permission is accorded by the Government, the lease of Government land should be paid as fixed by the Government only.
- 12) The industry should obtain the prior concurrence of concerned Department for laying pipeline and for crossing etc.
- 13) The industry should make their own arrangements for supplementation of water in their premises only.
- 14) The Irrigation & CAD Department reserves the right for cancellation of the permission without assigning any reasons thereof.
- 15) The Irrigation & CAD Department is no way responsible of non-supply/Non Availability of water due to any reasons in any particular water year and lean period i.e. from 1st January to 30th May.
- 16) The Industry must strengthen the canal margin 100 Mts. on either side of the proposed off take point to avoid slips, erosion of banks and to protect existing margins as directed by the Department.
- 17) The industry should lay the pipeline duly leaving not less than 1.00 Mt. from the toe of the flood bank.

Contd.. 3.,

- 18) The industry has to construct CC walls to avoid leakages at pipe line crossings.
- 19) The industry should follow the Revenue Board Standing orders (B.S.O).
- 20) The industry should pay security deposit at 2.5% on 10 years water charges for which permission is granted.
- 21) The permission accorded shall be for a period of 10 years only. The permission shall have to be renewed well in advance before the expiry of the permission.
- 22) The Industry shall pay one year water charges as advance and amounts due to the Department before entering into renewal agreement.
- 23) The industry should make its own arrangements duly creating storage facilities for the requirement of water for the period from 1st January to 30th May in their premises only.
- 24) The present rate of royalty charges as per the G.O.Ms. No.39, I&CAD(PW:QC&IWS/COD) Department, Dated:02-04-2002 is Rs.4.50 per 1000 gallons for consumptive use. The water royalty charges are likely to be revised by the Government from time to time and the industry shall pay the revised rates as fixed by the Government from time to time. Royalty charges should be paid every month and non-payment of Royalty charges in any month should result in stoppage of water.
- 25) The firm has to pay the water charges for the estimated quantity in advance at the start of the Financial Year (i.e) before 10th April every year as per BSO.
- 26) The consumptive utilization of water 3000 M³ per day as required should not be exceeded under any circumstances.
- 27) A detailed plan showing the location, the intake arrangements, conveyance system etc., shall be furnished to the Department.
- 28) The industry shall abide any other conditions laid down by the Government/ Department from time to time.
- 29) The permission does not confer any riparian right to the industry.
- 30) Non adherence to any of the conditions by the industry entails cancellation of the permission.

4. The Engineer-in-Chief(Irrigation), Hyderabad shall take necessary action accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

B. ARAVINDA REDDY,
PRINCIPAL SECRETARY TO GOVERNMENT.

To
The Engineer-in-Chief(Irrigation), I&CAD Department,
Errum Munzil, Jalasouda Building, Hyderabad.

P.T.O.,

The Collector & District Magistrate, Kurnool.
The Managing Director, A.P. Pollution Control Board, Hyderabad.

Copy to:

The Chief Engineer, Irrigation Circle, Kurnool.
The Superintending Engineer, Irrigation Circle, Kurnool.
The Commissioner of Industries, Hyderabad.
The O.S.D. to Minister for Major & Medium Irrigation.
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Gondiparla(V), Kurnool District through E.N.C.(Irr.), Hyd.
SF/SC.

//FORWARDED :: BY ORDER//

I. Satyanarayana
SECTION OFFICER.
swamy



Material Safety Data Sheet FOR Liquid Chlorine

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Liquid Chlorine

Trade name : Liquid Chlorine

Synonyms : Liquid Chlorine

Chemical Formula : Cl₂

Molecular Weight : 35.45

CAS Registry No. : 7782-50-5

UN No. : 1017

3. Hazards Identification :

THIS PRODUCT : corrosive, toxic and a major potential hazard upon contact to skin, eyes and respiratory tract.

TOXICITY ROUTES OF EXPOSURE : Ingestion can cause severe burns of the mucous membranes of the mouth, esophagus and stomach; pain, nausea and vomiting may also occur. Inhalation causes irritation of the upper respiratory tract resulting in cough, burning of the throat and choking sensation. Skin contact to a high concentration of the HCl gas or liquid may cause burns; repeated or prolonged exposures to dilute solutions may cause dermatitis. Eye exposure to high concentration of the acid can cause eye irritation to severe destruction like prolonged or permanent visual impairment, including blindness. These effects occur rapidly affecting all parts of the eye. Mist can also cause irritation to destructive burns. OVEREXPOSURE : Can cause serious damage to all body tissues contacted.

MEDICAL CONDITIONS AGGRAVATED BY

EXPOSURE : Fumes may aggravate eye, skin or respiratory conditions. Effects are usually limited to inflammation and occasionally ulceration of the nose, throat and larynx, if inhaled deeply, pulmonary edema may occur.

4. First Aid Measures :

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before

reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

5. Fire Fighting Measures :

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: water

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents. Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. For small fires, contain and let burn. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuation radius: 800 meters.


6. Accidental Release Measures

AIR RELEASE:

Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:

Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash

	<p>SREE RAYALASEEMA ALKALIESAND ALLIED CHEMICALS LIMITED, KURNOOL.</p>
<p>WATER RELEASE: Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Absorb with activated carbon. Collect spilled material using mechanical equipment.</p> <p>OCCUPATIONAL RELEASE: Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Notify Local Emergency.</p> <p>7. Handling and Storage : STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store outside or in a detached building. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ.</p> <p>8. Exposure controls and protection : EXPOSURE LIMITS: CHLORINE: 1 ppm (3 mg/m³) OSHA ceiling 0.5 ppm (1.5 mg/m³) OSHA TWA 1 ppm (3 mg/m³) OSHA STEL 0.5 ppm ACGIH TWA 1 ppm ACGIH STEL 0.5 ppm (1.45 mg/m³) NIOSH recommended ceiling 15 minute(s) VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits. EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. CLOTHING: Wear appropriate chemical resistant clothing. GLOVES: Wear appropriate chemical resistant gloves. RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 5 ppm Any chemical cartridge respirator with cartridge(s) providing protection against this substance. Any supplied-air respirator. 10 ppm Any supplied-air respirator operated in a continuous-flow mode. Any powered, air-purifying respirator with cartridge(s) providing protection against this substance. Any chemical cartridge respirator with a full face piece and cartridge(s) providing protection against this substance. Any air-purifying respirator with a full face piece and a</p>	<p>canister providing protection against this substance. Any self-contained breathing apparatus with a full face piece. Any supplied-air respirator with a full face piece. Escape - Any air-purifying respirator with a full face piece and a canister providing protection against this substance. Any appropriate escape-type, self-contained breathing apparatus. For Unknown Concentrations or Immediately Dangerous to Life or Health - Any supplied-air respirator with full face piece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full face piece.</p> <p>9. Physical and Chemical Properties PHYSICAL STATE: gas COLOR: yellow or green ODOR: distinct odor, irritating odor MOLECULAR WEIGHT: 70.906 MOLECULAR FORMULA: Cl₂ BOILING POINT: -31 F (-35 C) FREEZING POINT: -150 F (-101 C) VAPOR PRESSURE: 5168 mmHg @ 21 C VAPOR DENSITY (air=1): 2.49 SPECIFIC GRAVITY: Not applicable</p> <p>10. Stability and reactivity Stability : Stable under normal handling conditions. Hazardous polymerization will not occur. Hazardous decomposition product: HCl gas will not decompose. Materials and conditions to avoid (incompatibility) are: Avoid high temperatures. Containers may burst. Corrosive to most metals, concrete, some plastics, some rubber and coatings. Fumes form droplets which settle and promote corrosion of metals and unprotected equipment. Mixing with strong acids can cause evolution of hydrogen chloride gas. Oxidizing agents will cause the release</p>



Material Safety Data Sheet FOR CAUSTIC SODA

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied
Chemicals Ltd., Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Sodium Hydroxide

Trade name : Caustic Soda

Synonyms : Liquid Caustic Soda,
Caustic Soda Lye,
Lye Solution, Caustic
Soda Flakes.

Chemical Formula : NaOH

Molecular Weight : 40 g/mole

CAS Registry No. : 1310-73-2

UN No. : 1823/1824

3. Hazards Identification :

THIS PRODUCT MAY BE : Corrosive, toxic and a major
potential hazard upon contact to skin and eyes.

Toxicity Routes Of Exposure: Ingestion can cause
severe burning and pain in lips, mouth, tongue, throat and
stomach, Death can result from ingestion.

Over Exposure : Causes burns and scarring. Can cause
serious damage to all body tissues contacted.

Cancer Information : Not applicable.

Medical Conditions Aggravated By Exposure : Chronic
eye or skin conditions.

4. First Aid Measures :

SKIN : Remove contaminated clothing and immediately
wash skin for a minimum of 15 minutes. Call or see a
Physician.

EYES : Immediately flush eyes with large amount of
water, occasionally lifting the upper and lower eyelids and
rotating the eyeballs. Continue flushing for a minimum of
15 minutes. See a physician.

INHALATION : Remove to fresh air, if breathing stops,
administer artificial respiration. See a physician.

INGESTION : DO NOT Induce vomiting, if person is
conscious, give 2 or more glasses of water, if unconscious,
never give anything by mouth. See a physician
immediately.

5. Fire Fighting Measures :

Auto ignition Point : Not Applicable

Flammability/Explosive limits : Not applicable

Fire/Explosion Hazards : Contact with strong acids
may generate enough heat to ignite combustibles.

Fire Prevention : Not Applicable.

6. Accidental Release Measures

In case of spill or release : Completely contain
spilled material with dikes, sandbags, etc., and
prevent run off into the ground or surface waters
or sewers. Recover as much caustic material as
possible into containers for disposal. Add water
and neutralize remaining caustic material with
dilute hydrochloric acid, citric acid or another solid
acidic material to a pH between 6 and 9. Collect
neutralized caustic with a dry sorbent. Flush
residual neutralized waste to the drain with excess
water.

7. Handling and Storage :

Storage Requirements : Keep container tightly
closed.

For Small Volumes : May be stored in plastic jugs.

For Large Volumes : May be stored in steel storage
tanks.

Incompatible Materials : Store away from acids. (
Refer to Section X)

8. Exposure Controls and Protection :

Adequate ventilation needed.


TLV C : 2 mg/m³

Protective Equipment for the eyes and skin :

Goggles, respirator, disposable latex/rubber apron,
PVC rain suit, rubber boots with pant legs over
boots.

Precautionary Hygiene/control measures:

Avoid contact with skin, eyes, and clothing. Do
not breathe mist or vapor. Wash thoroughly after
handling. Safety showers and eye wash fountains
should be available in storage and handling area.

	<p>SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED, KURNOOL.</p>
<p>9. <u>Physical and chemical properties</u> STATE : ; Liquid APPEARANCE : Colorless or slightly turbid ODOR : Irritating pH : Strong base >14 BOILING POINT : 1390°C for -50% NaOH Solution FLASH POINT : Not determined SPECIFIC GRAVITY: 1.48 – 1.52 for Lye SPECIFIC GRAVITY: 2.12 for Flakes VAPOR PRESSURE -6.3 mm Hg @ 40 °C SOLUBILITY IN: Water : miscible, ACID: miscible</p> <p>10. <u>Stability and reactivity</u> Stable under normal handling conditions, Materials and conditions to avoid (incompatibility) are:</p> <ul style="list-style-type: none"> - Chlorinated hydrocarbons, acetaldehyde, acrolein, aluminum, chlorine trifluoride, hydroquinone, maleic anhydride, and phosphorous pentoxide. - Dilution with water evolves large quantity of heat. <p>Hazardous decomposition & combustion product – none. Hazardous polymerization will not occur.</p> <p>11. <u>Toxicological Information :</u> Effects from skin contact – Contact with skin can cause severe burns with deep ulcerations. Contact with solution or mist can cause multiple burns with temporary loss of hair at burn site. Effects from eye contact – Liquid in the eye can cause severe destruction and blindness. These effects can occur rapidly affecting all parts of the eye. Mist can cause irritation with high concentration causing destructive burns.</p>	<p>12. <u>Ecological Information :</u> Eco toxicity data : High basicity may pose potential hazard to plant and marine life.</p> <p>13. <u>Disposal Consideration</u> Dispose of in accordance with all Government and Local regulations.</p> <p>14. <u>Transport Information</u> Transportation of Dangerous Goods TDG Classification: Do not ship by air. DOT Hazard Classification : Class B: Corrosive DOT Shipping Name : Sodium Hydroxide ID: UN1824.</p> <p>15. <u>Regulatory Information:</u> APPCB, Kurnool. Dy. Chief Inspector of Factories, Kurnool</p> <p>16. <u>Disclaimer</u> Information contained in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.</p> <p>Contact Person : Mr. N. Jeswantha Reddy E D (Technical) Phone : 08518 280006</p>



Material Safety Data Sheet FOR CAUSTIC POTASH

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Potassium Hydroxide

Trade name : Caustic Potash

Synonyms : Liquid Caustic Potash,
Caustic Potash Lye,
Lye Solution, Caustic
Potash Flakes.

Chemical Formula : KOH

Molecular Weight : 56.11 g/mole

CAS Registry No. : 1310-58-3

UN No. : 1813

3. Hazards Identification :

THIS PRODUCT MAY BE : Corrosive, toxic and a major potential hazard upon contact to skin and eyes.

Toxicity Routes Of Exposure: Ingestion can cause severe burning and pain in lips, mouth, tongue, throat and stomach, Death can result from ingestion.

Over Exposure : Causes burns and scarring. Can cause serious damage to all body tissues contacted.

Cancer Information : Not applicable.

Medical Conditions Aggravated By Exposure : Chronic eye or skin conditions.

4. First Aid Measures :

SKIN : Remove contaminated clothing and immediately wash skin for a minimum of 15 minutes. Call or see a Physician.

EYES : Immediately flush eyes with large amount of water, occasionally lifting the upper and lower eyelids and rotating the eyeballs. Continue flushing for a minimum of 15 minutes. See a physician.

INHALATION : Remove to fresh air, if breathing stops, administer artificial respiration. See a physician.

INGESTION : DO NOT Induce vomiting, if person is conscious, give 2 or more glasses of water, if unconscious, never give anything by mouth. See a physician immediately.

5. Fire Fighting Measures :

Auto ignition Point : Not Applicable

Flammability/Explosive limits : Not applicable

Fire/Explosion Hazards : Contact with strong acids may generate enough heat to ignite combustibles.

Fire Prevention : Not Applicable.

6. Accidental Release Measures

In case of spill or release : Completely contain spilled material with dikes, sandbags, etc., and prevent run off into the ground or surface waters or sewers. Recover as much caustic material as possible into containers for disposal. Add water and neutralize remaining caustic material with dilute hydrochloric acid, citric acid or another solid acidic material to a pH between 6 and 9. Collect neutralized caustic with a dry sorbent. Flush residual neutralized waste to the drain with excess water.

7. Handling and Storage :

Storage Requirements : Keep container tightly closed.

For Small Volumes : May be stored in plastic jugs.

For Large Volumes : May be stored in steel storage tanks.

Incompatible Materials : Store away from acids. (Refer to Section X)

8. Exposure Controls and Protection :

Adequate ventilation needed.


TLV C : 2 mg/m³

Protective Equipment for the eyes and skin :

Goggles, respirator, disposable latex/rubber apron, PVC rain suit, rubber boots with pant legs over boots.

Precautionary Hygiene/control measures:

Avoid contact with skin, eyes, and clothing. Do not breathe mist or vapor. Wash thoroughly after handling. Safety showers and eye wash fountains should be available in storage and handling area.

	<p>SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED, KURNOOL.</p>
<p>9. <u>Physical and chemical properties</u> STATE : Liquid APPEARANCE : Colorless or slightly turbid ODOR : Irritating pH : Strong base >14 BOILING POINT : 1320°C for-50% KOH Solution FLASH POINT : Not determined SPECIFIC GRAVITY: 1.48 – 1.52 for Lye SPECIFIC GRAVITY: 2.044 for Flakes VAPOR PRESSURE : SOLUBILITY IN: Water : miscible, ACID: miscible MELTING POINT : 380 °C</p> <p>10. <u>Stability and reactivity</u> Stable under normal handling conditions, Materials and conditions to avoid (incompatibility) are:</p> <ul style="list-style-type: none"> - Chlorinated hydrocarbons, acetaldehyde, acrolein, aluminum, chlorine trifluoride, hydroquinone, maleic anhydride, and phosphorous pentoxide. - Dilution with water evolves large quantity of heat. <p>Hazardous decomposition & combustion product – none. Hazardous polymerization will not occur.</p> <p>11. <u>Toxicological Information :</u> Effects from skin contact – Contact with skin can cause severe burns with deep ulcerations. Contact with solution or mist can cause multiple burns with temporary loss of hair at burn site. Effects from eye contact – Liquid in the eye can cause severe destruction and blindness. These effects can occur rapidly affecting all parts of the eye. Mist can cause irritation with high concentration causing destructive burns.</p>	<p>12. <u>Ecological Information :</u> <u>Eco toxicity data</u> : High basicity may pose potential hazard to plant and marine life.</p> <p>13. <u>Disposal Consideration</u> Dispose of in accordance with all Government and Local regulations.</p> <p>14. <u>Transport Information</u> Transportation of Dangerous Goods TDG Classification: Do not ship by air. DOT Hazard Classification : Class B: Corrosive DOT Shipping Name : Potassium Hydroxide ID: UN1824.</p> <p>15. <u>Regulatory Information:</u> APPCB, Kurnool. Dy. Chief Inspector of Factories, Kurnool</p> <p>16. <u>Disclaimer</u> Information contained in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.</p> <p>Contact Person : Mr. N. Jeswantha Reddy E D (Technical) Phone : 08518 280006</p>



Material Safety Data Sheet FOR HYDROCHLORIC ACID

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Hydrochloric Acid

Trade name : Hydrochloric Acid

Synonyms : Muriatic Acid,
Hydrogen Chloride,
Chlorohydric Acid

Chemical Formula : HCl

Molecular Weight : 36.45

CAS Registry No. : 7647-01-0

UN No. : 1789

3. Hazards Identification :

THIS PRODUCT : corrosive, toxic and a major potential hazard upon contact to skin, eyes and respiratory tract.

TOXICITY ROUTES OF EXPOSURE : Ingestion can cause severe burns of the mucous membranes of the mouth, esophagus and stomach; pain, nausea and vomiting may also occur. Inhalation causes irritation of the upper respiratory tract resulting in cough, burning of the throat and choking sensation. Skin contact to a high concentration of the HCl gas or liquid may cause burns; repeated or prolonged exposures to dilute solutions may cause dermatitis. Eye exposure to high concentration of the acid can cause eye irritation to severe destruction like prolonged or permanent visual impairment, including blindness. These effects occur rapidly affecting all parts of the eye. Mist can also cause irritation to destructive burns. OVEREXPOSURE : Can cause serious damage to all body tissues contacted.

MEDICAL CONDITIONS AGGRAVATED BY

EXPOSURE : Fumes may aggravate eye, skin or respiratory conditions. Effects are usually limited to inflammation and occasionally ulceration of the nose, throat and larynx, if inhaled deeply, pulmonary edema may occur.

4. First Aid Measures :

SKIN : Remove contaminated clothing and immediately wash skin for a minimum of 15 minutes. Call or see a physician.

EYES : Immediately flush eyes with large amount of water. Occasionally lifting the upper and lower eyelids and rotating the eyeballs. Continue flushing for a minimum of

15 minutes. Call a physician.

INHALATION : Remove to fresh air. If breathing stops, administer artificial respiration. Call a physician. INGESTION : DO NOT induce vomiting. Rinse or wash mouth with water. If person is conscious, give 2 or more glasses of water. If unconscious, never give anything by mouth. See a physician immediately.

5. Fire Fighting Measures :

Auto ignition Point : Not Applicable

Flash Point : Not Applicable

Flammability/Explosive limits : Not Applicable

Fire/Explosion Hazards: Emits toxic and choking fumes of hydrogen chloride. Hydrochloric acid is not flammable but flammable and explosive hydrogen gas may be formed on contact with metals. Fire Prevention/ Extinguishing Media : Not Applicable

6. Accidental Release Measures

IN CASE OF SPILL OR RELEASE;

Move people from the area. Move upwind. Avoid contact with acid. Stop leaks if safe to do so. Reposition container if this will reduce or stop leakage. If leak continues, remove leaking container from vehicle or move other materials from vehicle away from container. Absorb spill with sand or earth. If available, cover the spill with excess soda ash, lime or sodium bicarbonate, otherwise, wash away with large amounts of water. Scoop slurry to plastic drums. If leak cannot be safely stopped or if contents cannot be safely transferred to a sound container, contact fire brigade.

7. Handling and Storage :

Storage Requirements: Keep container tightly closed. FOR SMALL VOLUMES: Maybe stored in plastic jugs, carboys, and plastic drums.

FOR LARGE VOLUMES: Store in rubber-lined or epoxy lined steel storage tanks or fiber glass reinforced polyester (FRP) tanks.

Incompatible Materials: Store away from heat

Use Instructions: Wear suitable protective clothing, gloves and eye/face protection. In case of insufficient ventilation, wear suitable respiratory equipment.



SREE RAYALASEEMA ALKALIESAND
ALLIED CHEMICALS LIMITED,
KURNOOL.

8. Exposure controls and protection :

Ventilation: Use only in well-ventilated areas.

Protective Equipment for the eyes and skin :

Splash proof and face shield goggles, disposable latex/rubber apron, PVC rain suit, rubber boots with pant legs over boots. Respiratory Protection Requirements: NIOSH/MSHA approved

respirator should be used. Precautionary Hygiene/control measures : Avoid contact with skin, eyes, and clothing. Do not breathe mist or vapor. Wash thoroughly after handling. Safety

showers and eye wash fountains should be available in storage and handling area. Any protective clothing contaminated with hydrochloric acid should be removed immediately and thoroughly laundered before wearing again.

9. Physical and Chemical Properties

STATE: Fuming liquid

APPEARANCE: Colorless to slightly yellow

ODOR : Irritating

pH : Strong acid <1

BOILING POINT : 850 C

FLASH POINT ; Not determined

SPECIFIC GRAVITY : 1.150 -1.164

VAPOR PRESSURE : 20 hPa @ 200 C

SOLUBILITY IN : WATER: miscible, BASE : miscible

10. Stability and reactivity

Stability : Stable under normal handling conditions.

Hazardous polymerization will not occur.

Hazardous decomposition product: HCl gas will not decompose. Materials and conditions to avoid (incompatibility) are: Avoid high temperatures. Containers may burst. Corrosive to most metals, concrete, some plastics, some rubber and coatings. Fumes form droplets which settle and promote corrosion of metals and unprotected equipment. Mixing with strong acids can cause evolution of hydrogen chloride gas. Oxidizing agents will cause the release of toxic chlorine gas. Contact of liquid acid or gas with alkali or active metal may develop enough heat to cause fire in adjacent combustible material.

11. Toxicological Information :

Reproductive Effects: No data available

MUTAGENICITY : Not applicable

CANCER INFORMATION: Not applicable

12. Ecological Information :

ECOTOXICITY DATA: High acidity may pose potential hazard to plant and marine life.

WATER-POLLUTION RISK

CLASSIFICATION: Slightly water - polluting substance.

13. Disposal Consideration

Dispose of in accordance with all Government and Local regulations.

14. Transport Information

Transportation of Dangerous Goods

TDG Classification: Do not ship by air.

DOT Hazard Classification: Class 8 : Corrosive:

Group II DOT Shipping Name : Hydrochloric acid

ID: UN 1789

15. Regulatory Information:

APPCB, Kurnool.

Dy.Chief Inspector of Factories,
Kurnool

16 . Other Information

Information containing in this MSDS is believe to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.

Contact Person : Mr. N. Jeswantha Reddy
E D (Technical)

Phone : 08518 280006

SREE RAYALASEEMA ALKALIES & ALLIED CHEMICALS LIMITED,
KURNOOL.
MATERIAL SAFETY DATA SHEET FOR METHYLENE CHLORIDE.

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd.,
Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name :Dichloromethane

Synonyms : Methylene Chloride, Methylene Dichloride.

Chemical Formula : CH_2Cl_2

Molecular Weight : 84.93

CAS Registry No. : 75-09-2.

3. Hazards Identification :

Colorless volatile liquid , penetrating (ether like)odor.

Inhalation: Causes anesthetic effects, nausea, drunkenness.

Skin :Contact causes irritation. Prolonged contact may result in dermatitis.

Eyes : Causes irritation, may cause temporary corneal damage.

Ingestion : Harmful. causes burns to mouth and throat.

4. First Aid Measures:

Inhalation : Remove the victim to fresh air area and provide oxygen if required.

Skin : Remove the contaminated clothes and wash the affected area with water and soap.

Eyes ; Wash with plenty of water for about 15 minutes. Seek medical aid.

Ingestion : Seek medical aid immediately.

5. Fire Fighting Measures : Use CO_2 Dry chemical powder, foam or water spray.

Unusual or explosive Hazards : Keep the container cool by spraying water. If exposed to heat or flame. Poisonous gases are produced in fire. Provide well ventilation to prevent formation of explosive mixture with air.

Flash point :Not pertinent.

Flammability : Yes

LEL : 15.5 °C (in $\text{O}_2\%$)

UEL : 66.4 °C (in $\text{O}_2\%$)

Emits toxic fumes of phosgene & Chlorine.

6. Accidental Release Measure: Shut off leaks if without risk. Absorb on sand or earth. Seal all the waste in vapors tight plastic bags for eventual disposal.

7. Handling and Storage :

Keep the containers tightly closed. Store in a cool, dry, well-ventilated area, away from oxidizers and chemically active metals.

8. Exposure controls and Personal protection :

Provide Organic vapors canister mask, face shield or safety goggles, protective clothing. Butyl Rubber gloves is a suitable material.

9.Physical & Chemical Properties:

Physical state : Colorless, volatile liquid.

Boiling point : 40 °C

Freezing Point : -96.7 °C

Specific Gravity : (at 27 °C) : 1.320

Vapor Pressure :97.7 mm of Hg at 20 °C

Solubility in water at 30 °C :1.2 gram / 100 gram of water.

10. Stability and reactivity

Chemical Stability : Stable.

Incompatibility : Strong oxidizers, caustic, chemically active metals such as Aluminum, Magnesium powder, Sodium, Potassium.

Decomposition products formed : Hydrochloric acid, Phosgene, Carbon monoxide, Carbon di oxide.

Hazardous Polymerization : Not to occur.

11. Toxicological Information :**Toxicity Data :**

Oral :LD50 2524 mg/kg (rat)

Inhalation :LC50 88g/meter cube (rat)

Dermal : LD50 6460mg/kg (mouse)

Skin: LD50 1500mg/kg (mouse)

Other:

Threshold limit value (TLV/TWA): 350mg/meter cube (100ppm)

Short-term exposure limit (STEL): None.

Acgih denotes that substance is suspect of carcinogenic potential for man.

Risk Phases : None..

12.Environmental Information : None.

13. Disposal Considerations : Disposal in accordance with all applicable and federal, state and local environment regulations.

14. Transport Information :

Proper shipping name : Dichloro methane.

Hazard Classification : 6.1

U.N./N.A.No:N 1593

Shipping label :Harmful, Stow away from food stuffs.

15. Regulatory Information :

APPCB, Kurnool.

Dy. Chief Inspector of Factories,
Kurnool.

16. Disclaimer :

Information containing in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.

Contact Person : Mr.N.Jeswanth Reddy

E D

Phone :08518 280006.



SREE RAYALASEEMA ALKALIES AND ALLIED
CHEMICALS LIMITED,
KURNOOL.

SREE RAYALASEEMA ALKALIES & ALLIED CHEMICALS LIMITED,
KURNOOL.
MATERIAL SAFETY DATA SHEET FOR METHYL CHLORIDE.

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd.,
Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Methyl Chloride

Synonyms : Chloro Methane

Chemical Formula : CH₃Cl

Molecular Weight : 50.45

CAS Registry No. : 74-87-3.

3. Hazards Identification :

Colorless gas with slight sweet odor.

Health Effects:

Eye: With gas : Will result in slight disturbances

With Liquid : Causes Frostbite, irritation to eyes.

Inhalation: Slight exposure; may appearance of drunkenness, staggering, dizziness, nausea and possible hiccups. These effects may be delayed for several days.

Moderate exposure; causes mental confusion and possible temporary loss of consciousness.

Severe or prolonged exposure; may cause abdominal pain, vomiting, extreme nervousness or trembling to convulsions and death.

High concentration; may cause dizziness and interfere with normal heart rhythm.

Ingestion : Unlikely.

4. First Aid Measures:

Eye : Wash with plenty of water and seek medical aid.

Skin : Remove contaminated cloths. Wash with plenty of water and seek medical aid.

Ingestion : None required as product is a gas at room temperature.

Inhalation : Remove the victim to fresh air area. Quickly seek medical aid. The Physician should be instructed not to use Adrenaline as a stimulant in this case of Methyl Chloride poisoning. Further treatment should be symptomatic and supportive.

5. Fire Fighting Measures : Use CO₂ Dry chemical powder, foam or water spray.

Unusual or explosive Hazards : Keep the container cool by spraying water if exposed to heat or flame. Poisonous gases are produced in fire. Provide well ventilation to prevent formation of explosive mixture with air.

Flash point : < 0 °C

Flammable limits : (Open cup) Lower : 8.1%

Upper : 17.2%

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge with inert gas prior to attempting repairs.

If leak is in container or container valve, contact the appropriate emergency services.

7. Handling and Storage :

Store in cool place (below 48 °C) away from heat, flame, sparks.

8. Exposure controls and Personal protection :

Protective Equipment (type)

Safety glasses, safety shoes, safety shower, eyewash, face shield.

Eye/Face Protection

Safety goggles or glasses.

Skin Protection

Protective Gloves : Neoprene or Butyl rubber . Do not use PVC or polyethylene.

Respiratory Protection

Airborne concentration should be kept to lowest levels possible. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown. Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Ventilation

Adequate to meet component occupational exposure limits.

9. Physical & Chemical Properties:

Appearance : Colorless gas.

Odor : Slight sweet odor.

Others : Miscible with Chloroform, Ether, Glacial Acetic Acid.

Boiling point : - 23.7 °C

Freezing point : - 97 °C

Vapor Density : 1.45 at STP

(Air=1)

Specific Gravity : 0.92 (at 20 °C)(water=1)

Physical state : Gas

Vapor Pressure : 73.4 Pisa (At STP)

Solubility in water at 30 °C : 0.45%.

10. Stability and reactivity

Chemical Stability : Stable.

Incompatibility with other materials : Chemically Active Metals such as Potassium, Powdered Aluminum, Zinc, Magnesium.

Reactivity : Reacts violently with Lithium, Sodium, Potassium, Potassium-Tert-Butoxide.

Hazardous Reaction Products : Not Available.

11. Toxicological Information :

Toxicity Data :

Oral :

N.D.

Inhalation : Reproductive toxicity observed in male rats following an inhalation of 2000 ppm for 6 hours.

Developmental defects observed following inhalation exposure of pregnant female rats to 1500 ppm for 6 hours.

Dermal: N.D.

Skin: N.D.

Mutagenic : N.A.

Other : When inhaled, it enters the body cells where hydrolysis to hydrochloric acid and methyl alcohol occurs. This results in degenerative changes to the lungs, brain, kidney and liver.

Methyl chloride is readily absorbed into the body, but is very slowly given up, resulting in the possibility of latent toxicological effects. In fatal cases, autopsy has shown congestion of the lungs, liver and kidneys.

TLV (ACGIH): 60 PPM (105 mg/m³)

STEL 100 PPM (205 mg/m³)

12. Environmental Information : None.

13. Disposal Considerations :

Waste Disposal Methods :

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap to authorized distributor for proper disposal.

Remarks:

None.

14. Transport Information :

Shipping Name : Methyl Chloride.

Hazard Classification : 2.1

U.N.No: 1063

Shipping label : Flammable gas.

Additional marks required if weight is more than 100 pounds.

15. Regulatory Information :

APPCB, Kurnool.

Dy. Chief Inspector of Factories,
Kurnool.

16. Disclaimer :

Information containing in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.

Contact Person : Mr.N.Jeswanth Reddy

E D

Phone : 08518 280006.

SREE RAYALASEEMA ALKALIES & ALLIED CHEMICALS
LIMITED,
KURNOOL.
MATERIAL SAFETY DATA SHEET FOR CHLOROFORM

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied
Chemicals Ltd., Gondiparla, Kurnool.
Phone: 08518 280006, 7,8
Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Trichloro methane.
Synonyms : Chloroform.
Chemical Formula : CHCl_3
Molecular Weight : 119.4
CAS Registry No. : 67-66-3.

3. Hazards Identification :

Colorless liquid with pleasant sweet odor,

Effects of over exposure:

Inhalation: Causes dilation of pupils with reduced reaction to light as reduced intraocular pressure, irritation of mucous membrane, conjunctiva and skin followed by excitation, loss of reflexes, sensation and consciousness. Prolonged inhalation leads to paralysis and finally to death.

Eye & Skin : Causes irritation.

Ingestion : Causes dryness of mouth and throat, headache, nausea and dizziness'.

Chronic:

Kidney disorder, liver disorder, heart disorder, skin disorder.

4. First Aid Measures:

Inhalation : Remove the victim to fresh air, if not breathing- give artificial respiration. If breathing is difficult- give oxygen.

Skin : Flush the affected parts with plenty of water.

Eyes : Flush with water for 15 minutes.

Ingestion : If conscious, induce vomiting. Give him plenty of water & milk.

5. First Aid:

Fire Fighting Media:

Non flammable. Use extinguisher media appropriate for surrounding fire.

Use water to keep the fire-exposed container-cool. If decomposes, produces toxic gases.

6. Accidental Release:

Shut off leaks if without risk. Absorb on sand or earth. Seal all waste in vapor tight plastic bags for eventual disposal.

7. Handling and Storage :

Keep the containers tightly closed . Store in secured poison area.

8. Exposure controls and Personal protection :

Wear safety, goggles, self-contained breathing apparatus, air tight mask, PVC gloves.

9. Physical & Chemical Properties:

Physical state : Colorless liquid.

Boiling point : 61 °C

Freezing Point : -64 °C

Specific Gravity : (at 27 °C) : 1.480

Vapor Pressure : 159 mm of Hg at 20 °C

Solubility in water : 0.79gm/100gm of water.

10. Stability and reactivity

Chemical Stability : Stable.

Incompatibility : Strong bases, alkali metals, Aluminium, strong oxidizing agents.

Conditions to avoid: Avoid to heat, flame and other sources of ignition, light, air and moisture.

Decomposition products : May decomposes to chlorine, Hydrochloric acid, Phosgene,

Hazardous Polymerization : None.

11. Toxicological Information :

Toxicity Data :

TLV : 10 ppm (50 mg/m³)

PEL : 50 ppm (240 mg/m³)

12. Environmental Information : None.

13. Disposal Considerations : Disposal in accordance with all applicable and federal, state and local environment regulations.

14. Transport Information :

Proper shipping name : Chloroform.

Hazard Classification : 6.1

U.N./N.A.No:N 1888.

Shipping label : Poison.

15. Regulatory Information :

APPCB, Kurnool.

Dy. Chief Inspector of Factories,
Kurnool.

16. Disclaimer :

Information containing in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.

Contact Person : Mr.N.Jeswanth Reddy

E D

Phone

:08518 280006.



SREE RAYALASEEMA ALKALIES AND
ALLIED CHEMICALS LIMITED,
KURNOOL.

SREE RAYALASEEMA ALKALIES & ALLIED CHEMICALS LIMITED,
KURNOOL.
MATERIAL SAFETY DATA SHEET FOR CARBON TETRA CHLORIDE

1. Company Identification:

M/s Sree Rayalaseema Alkalies & Allied Chemicals Ltd.,
Gondiparla, Kurnool.

Phone: 08518 280006, 7,8

Toll Free No. : 08518 600092

2. Product Identification

Chemical Name : Carbon tetra chloride.

Synonyms: Carbon chloride, Perchloro methane,
Benzinoform.

Chemical Formula : CCl_4

Molecular Weight : 153.8

CAS Registry No. : 56-23-5.

3. Hazards Identification :

Colorless liquid with distinct odor.

Eyes : Causes irritation.

Skin : causes irritation, digestive disorders, headache,
dizziness.

Inhalation: Causes dizziness, loss of coordination,
anesthesia, may be accompanied by nausea, liver damage
and kidney damage. Often reduces urinary output. Damages
central nervous system.

Ingestion : Causes irritation, digestive disorders, head ache,
drowsiness, dizziness, loss of coordination, lung congestion,
effects on the brain, convulsions, coma, kidney damage, liver
damage, reproductive effect and cancer.

4. First Aid Measures:

Eye Contact : Flush eyes with plenty of water for at least 15
minutes. Then get immediate medical attention.

Skin Contact : Wash skin with soap and water for at least 15
minutes while removing contaminated clothing and shoes.
Get medical attention, if needed. Thoroughly clean and dry
contaminated clothing and shoes before reuse.

Ingestion : If swallowed, drink plenty of water, do not
induce vomiting. Get immediate medical attention. Induce
vomiting only at the instructions of a physician. Do not give
any by mouth to unconscious or convulsive person.

Inhalation : If adverse effect occur, remove to
uncontaminated area. Give artificial respiration if not
breathing. Get immediate medical attention.

5. Flammability : No.

Flash point : Not flammable.

Hazardous combustion products : Emits toxic fumes of
Chlorine & Phosgene.

Hazardous Polymerization : Will not occur.

Fire extinguishing Agent to be used.

Use regular Dry chemical, Foam and water. Move containers
from fire area if it can be done without risk. Absorb on sand
or earth for later disposal.

6. Accidental Release Measure :

Air Release: Use water spray.

Soil release : Trap spilled material at bottom in deep
water pocket or with in sand bag barriers. Dyke for
later disposal. Absorb with sand or other non-
combustible material. Seal all waste in vapor tight
plastic bags for eventual disposal.

Water Release : Remove trapped material at the
bottom with suction hose.

Occupational Release :

Do not touch spilled material. Stop leak if possible
without personal risk. Reduce vapor release with
water spray.

Small spills : Absorb with sand or other non-
combustible material. Collect spilled material in
appropriate container for disposal.

Small dry spills : Move containers away from spill to
a safe area.

Large spills : Dyke for later disposal. Keep
unnecessary people away, isolate hazard area and
deny entry. Ventilate closed spaces before entering.
Notify Local Emergency Planning Committee and
Emergency Response.

7. Storage : Protect from physical damage. Store in a
cool, dry place in a well-ventilated area. Avoid heat,
flames, sparks and other sources of ignition.

8. Exposure controls and Personal protection :

Wear safety glasses, gloves, provide PVC or rubber
hand gloves, air supplied mask, organic vapor
canister with full face masks, rubber apron and
shoes.

9. Physical & Chemical Properties:

Physical state : Colorless liquid.

Boiling point : 77 °C

Freezing point : -23 °C

Specific gravity at 27 °C : 1.590

Vapor pressure at 20 °C : 91 mm of Hg.

Solubility in water : 0.08g/100 cc.

10. Stability and reactivity :

Reactivity :

Stable at normal temperature and pressure.

Conditions to avoid :


Avoid heat, flames, sparks and other sources of
ignition. Containers may rupture or explode if
exposed to heat.

Incompatibilities :

Combustible materials, metal salts, peroxides,
halogens, oxidizing materials, metals, bases, amines.

Hazardous Decomposition :

Thermal decomposition products : Phosgene,

<p>halogenated compounds and oxides of carbon.</p> <p>Hazardous Polymerizations : Not occur.</p> <p>11. Toxicological Information : Permissible exposure limit : Skin 5 ppm, 30 mg/m³ TLV : skin 5 ppm., 30 mg/m³ Odor Threshold : >10ppm</p> <p>12.Environmental Information : Aquatic toxicity : Fish : 43100 microgram/L..96 hours. Potential to Bioaccumulations : Not detectable.</p> <p>13. Disposal Considerations : Disposal in accordance with all applicable and federal, state and local environment regulations.</p>	<p>14.Transport Information : Proper shipping name : Carbon Tetra Chloride. Hazard Classification : 6.1 U.N.No: 1846. Marine Pollutant : Carbon Tetra Chloride .</p> <p>15.Regulatory Information : APPCB, Kurnool. Dy. Chief Inspector of Factories, Kurnool.</p> <p>16.Disclaimer : Information containing in this MSDS is believed to be reliable. But no guarantee is made as to its accuracy, suitability for a particular application or results to be obtained from them.</p> <p>Contact Person : Mr.N.Jeswanth Reddy E D Phone : :08518 280006.</p>
	<p>SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED, KURNOOL.</p>

Title: Expansion of Chlor-Alkali (520 TPD to 1020 TPD) and Synthetic Organic Chemicals manufacturing (125.05 TPD to 260.1 TPD)

1. List of Products

S. No.	Product Name	Unit	Production Capacity			EC Requirement	Category as per EIA Notification, 2006	Remarks
			Existing	Proposed	Total after expansion			
1	Chlor-Alkali Plant	TPD	520	500	1020	EC required	4 (d) Chlor-Alkali Industry. Category 'A'	
	By- Products							
	1. Hydrochloric Acid (100%)	TPD	173	140	313	Not required	Not Applicable	
	2. Liquid Chlorine	TPD	300	300	600	Not required	Not Applicable	
	3. Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15	Not required	Not Applicable	
	4. Barium Sulphate	TPD	5	5	10	Not required	Not Applicable	
	5. Potassium Carbonate	TPD	50	--	50	Not required	Not Applicable	
	6. Sodium Sulphate	TPD	--	10	10	Not required	Not Applicable	
2	Synthetic Organic Chemicals							
	1. Methyl Chloride	TPD	0.45	10	10.45	EC required	5(f) Synthetic Organic Chemicals - Category 'A'	
	2. Methylene Chloride	TPD	61	61	122	EC required		
	3. Chloroform	TPD	56	46.45	102.45	EC required		
	4. Chlorodifluoromethane (R22)	TPD	--	10	10	EC required		
	By- Products							
	4. Carbon tetrachloride*	TPD	7.6	7.6	15.2	Not required	Not required	
	2. Hydrochloric Acid (100%)	TPD	23.5	31.77	55.27	Not required	Not required	
3	1. Captive Power Plant (CPP - Coal based)	MW	76	--	76	EC required	1(d) Thermal Power Plants	No Expansion in CPP
	2. Power generation Furnace Oil**	MW	31	--	31	EC required		
4	Oil and Fatty Acid Division	TPD	498	--	498	Not required	Not Applicable	

2. It may be noted that the proposal is for expansion of Chlor-Alkali unit and Synthetic organic chemicals within the existing land area of 152.4 ha.

3. Complete list of products is as follows;

S. No.	Product Name	Unit	Production Capacity		
			Existing	Proposed	Total
I. Chlor-Alkali Plant					
1	Caustic Soda Lye (Or) Flakes (100 % basis)	TPD	520	500	1020
	Potassium Hydroxide Lye (or) Flakes (100 % basis)				
	By-Products				
a	Hydrochloric Acid (100%)	TPD	173	140	313
b	Liquid Chlorine	TPD	300	300	600
c	Sodium Hypochlorite (100% Cl ₂ basis)	TPD	8	7	15
d	Barium Sulphate	TPD	5	5	10
e	Potassium Carbonate	TPD	50	--	50
f	Sodium Sulphate	TPD	--	10	10
II. Synthetic Organic Chemicals					
1	Methyl Chloride	TPD	0.45	10	10.45
2	Methylene Chloride	TPD	61	61	122
3	Chloroform	TPD	56	46.45	102.45
4	Chlorodifluoromethane (R22)	TPD	--	10	10
	By-Products				
a	Carbon tetrachloride*	TPD	7.6	7.6	15.2
b	Hydrochloric Acid (100 %)	TPD	23.5	31.77	55.27
III. Captive Power Plant					
1	Captive Power Plant (Coal based)	MW	76	--	76
2	Power generation Furnace Oil**	MW	31	--	31
IV. Oil and Fatty Acid Division					
1	Oil and Fatty Acid Products	TPD	498	--	498
	Detailed List of Non EC Products				
a	Hydrogenated Cator Oil	TPD	100		100
b	12-Hydroxy Stearic Acid/ Methyl 12-Hydroxy stearate / Ricinolic Acid	TPD	60		60
c	Dehydrated Castor Oil	TPD	10		10
d	NN BIS Amide	TPD	5		5
e	Bio - Diesel	TPD	10		10
f	Glycerine (Crude) / Glycerine Refined	TPD	75		75
g	Distilled Fatty Acid	TPD	20		20
h	Stearic Acid	TPD	35		35
i	Sodium Sulphate	TPD	6		6
j	Soap Noodles	TPD	100		100
k	Toilet Soaps and Bathing Bars	TPD	50		50
l	Calcium Hypochloride	TPD	10		10
m	Calcium Sulfate	TPD	2		2
n	Hydrochloric Acid (100%)	TPD	13		13
o	Sodium Hypochlorite	TPD	2		2

*Carbon Tetrachloride (CCl₄) generated will be sold as a feed stock to Authorized users/excess will be incinerated.

** Shall be kept as standby.

4. The unit obtained the following Environment Clearances for various production capacity in the past 10 years

S.No	Environment Clearance File No	Issue Date
1	J-11011/653/2007-IA II (I) a .Chlor - Alkali - 520 TPD b. Captive Power Plant (Coal based) - 76 MW	26.12.2007
2	J-11011/619/2009-IA II (I) a . Methyl Chloride - 0.45 TPD b. Methylene Chloride - 61 TPD c. Chloroform - 56 TPD	14.02.2012

5. The unit has a valid CTO vide letter no. APPCB/KNL/KNL/16332/CFO&HWA/HO/2014-6628 dated 04.03.2016 valid till 28.02.2021 and APPCB/KNL/KNL/16332/CFO&HWA/HO/2015 dated 06.06.2016 valid till 31.08.2021. (Copies are enclosed)

6. Certified compliance letter from the regional office of MoEFCC, Chennai is obtained vide letter no. 29.09.2016/1927 dated 29.09.2016 (Copy are enclosed)

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

E-mail : sansom_2859@yahoo.co.in

Telefax : 011-24360488

By Speed Post

No. J-11011/653/2007 - IA II (I)

Date: 26th December 2007

To,

M/s Shree Royalseema Alkalies and Allied Chemicals Ltd.
Gondiparla
Kurnool - 518 004
Andhra Pradesh

Subject: Expansion of Chemical Manufacturing Unit at Gondiparla, Kurnool, Andhra Pradesh by M/s Shree Royalseema Alkalies and Allied Chemicals Ltd.-
Environmental Clearance regarding.

Sir,

This is with reference to your application No. SRAAC/GMQA-MOEF/07 dated 27th June 2007 seeking environmental clearance for the above-mentioned project.

2. The Ministry of Environment and Forests has examined the proposal. It is noted that the proposal is for expansion of Chlor Alkali production by adding 75 TPD of additional capacity and enhancement of Captive Power Plant from 45 MW to 76 MW at the existing location at Gondiparla Village, Kurnool Mandal in Kurnool District, Andhra Pradesh. Land area available is 123.8 ha out of which green belt of 91.17 ha is proposed. Tungabhadra River is at 1.6 Km from the site. No ecologically sensitive area exists within 10 km periphery of the Project Site. No endangered species of Flora and Fauna has been reported. The Project does not involve any R & R. The cost of the Projects is Rs. 90 Crores, out of which Rs. 4.6 Crores will be earmarked for environmental protection measures. The following are the existing and proposed capacity of various products and By-Products along with CPP-

S. No.	Product Name	Existing Capacity (TPD)	Proposed Expansion (TPD)	Capacity After Expansion (TPD)
Chloro- Alkali Plant				
1	Caustic Soda Lye	160	150	320
2	Caustic Soda Flakes	140		
3	Potassium Hydroxide	70		
4	Hydrochloric Acid (100 % HCl)	105	68	173
5	Liquid Chlorine	200	100	300



जहाँ है हरियाली/
वहाँ है सुसहाली।

पर्यावरण भवन, सी.जी.ओ. कॉम्प्लेक्स, लोदी रोड, नई दिल्ली - 110 003
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI - 110 003

6	Sodium Hypochlorite (100%)	8	--	8
7	Barium Sulphate	5	--	5
8	Potassium Carbonate	10	40	50
Captive Power Plant				
1	Captive Power Plant (Coal Based)	45 MW	31 MW	76 W

3. 31 MW Furnace oil based DG Set will be kept as standby. Membrane Cell Technology shall be used and CPP will be based on coal. Vacuum de-chlorination will be used to recover Cl_2 in pure form. NaCl and Potassium Chloride are the main raw materials for Caustic Soda and Caustic Potash production. Common Salt shall be obtained from Company's own salt fields. 31 MW of Power from DG sets as standby shall remain unaltered. No additional storage area for HCl and Chlorine tonners is envisaged. The water requirement, after expansion will be 11266.65 m³/d which will be met from Tungabhadra River. The unit has obtained the permission to draw water from Tungabhadra River. Waste water generation will be 780 m³/day of trade effluent and 115 m³/day of domestic effluent which will be treated in ETP. The treated water shall be used for On- land irrigation. Rejects from Reverse Osmosis and effluent from chelating tower regeneration will be used for Brine make-up. 8.0 TPD of Brine sludge and ETP sludge shall be sent to secured landfill within plant premise. It is also proposed to treat the brine sludge with Citric Acid and to use the neutralized sludge as manure as it is rich in Potassium, Sodium and Phosphate. Barium Sulphate recovered from the sludge shall be sold as by-product. Sludge from Potash stream shall be used as nutrient. The waste oil and used batteries shall be sold to authorized recyclers. Ash from boilers shall be sent to brick manufactures. Spent Nickle and Earth shall be sold to authorized recyclers.

4. The project activity is listed at 4 (d) and is of 'A' Category in the Schedule of EIA Notification, 2006. The project was considered as per EIA Notification, 1994 as per Para 2.2.1 (i) (a) of the Interim Operation Guidelines dated 13th October 2006 issued by the Ministry. Public Hearing of the project was held on 15.06.2007.

5. Based on the information provided, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006 subject to the compliance of the following conditions:

A. SPECIFIC CONDITIONS:

- (i) Project shall be based on Membrane Cell Technology only.
- (ii) The gaseous emissions (SO_x , NO_x , Cl_2 and HCl) and Particulate matter along with RSPM from various process units shall conform to the prescribed norms by the

Contd.



concerned authorities from time to time. At no time, the emission levels shall go beyond the stipulated standards. The stack height shall be as per the CPCB guidelines. In the event of failure of pollution control system(s) adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Further, the company shall interlock the production system with the pollution control devices.

- (iii) Low Sulphur and Low Ash Coal shall be used as Fuel for the Captive Power Plant.
- (iv) For the control of air emission from the Captive Power Plant, Electro Static Precipitator with a stack height of about 90 m shall be provided and SPM levels in the flue gas would be less than 50 mg / Nm³.
- (v) Regular monitoring of ambient air quality shall be carried out including HCl and Chlorine. The location of the existing ambient air quality monitoring stations shall be reviewed in consultation with the SPCB and additional stations shall be set up, if required. It will be ensured that at least one station is in the down-wind direction.
- (vi) The fugitive emissions in the work zone environment, product, raw material storage area shall be regularly monitored and data shall be submitted to the concerned authorities. The emissions shall be controlled and conform to the limits prescribed by the CPCB in future.
- (vii) The Ambient Noise Level will be within 45 - 50 dB (A).
- (viii) The vent gases from Chlorine absorber of Sodium Hydrochlorite Plant and HCl Plant shall be controlled at source by effective absorption system so that Chlorine concentration in the vent gases shall not exceed 5 ppm. The vent gases shall be discharged from the stacks of adequate height for effective dispersion. A close circuit high capacity emergency scrubbing system for Chlorine shall also be installed. All vents of HCl switched tank and loading area shall be connected to the scrubbing system.
- (ix) Chlorine sensors shall be provided at liquid Chlorine storage area, vent pipes of Sodium Hypo-Plant, Electrolysis area and HCl manufacturing unit with inter-locking facility to automatically start scrubbing system whenever Chlorine in storage area is more than 5 PPM. On-line Hydrogen and Chlorine analyzer shall also be installed.
- (x) Flame arresters shall be provided to arrest H₂ generated.
- (xi) Water consumption shall not exceed 11,266.65 m³/d which will be met from Tungabhadra River.



Contd.

- (xii) Waste water generation shall not exceed 780 m³/day of trade effluent and 115 m³/day of domestic effluent which shall be treated in the ETP. The treated water shall be used for On- land irrigation. Rejects from Reverse Osmosis and effluent from chelating tower regeneration shall be used for Brine make-up.
- (xiii) The sludge generated shall not exceed 8.0 TPD of Brine Sludge which shall be disposed off in the secured landfill within the premises. ETP sludge shall also be sent to the secured landfill within the plant site. The landfill shall be as per the CPCB guidelines and approved by the State Pollution Control Board. Requisite authorization shall be obtained under the Hazardous Wastes (Management and Handling) Rules, 1989, as amended. Alternatively, treatment of Brine sludge with Citric Acid shall be carried out to use the neutralized sludge as manure. Barium Sulphate recovered from the sludge shall be sold as by-product. Sludge from Potash stream shall be used as nutrient. The waste oil and used batteries shall be sold to authorized recyclers. Ash from boilers shall be sent to Brick Manufactures. Spent Nickle and Earth shall be sold to authorized recyclers.
- (xiv) The company shall comply with the recommendation made in Risk Assessment report and shall update the existing Disaster Management Plan.
- (xv) 91.17 ha of the total area shall be developed as green belt as per the CPCB guidelines and in consultation with DFO.
- (xvi) Responses to issues raised during Public Hearing shall be implemented by the Company.
- (xvii) The project authorities shall earmark Rs. 4.6 Crores and adequate recurring funds to implement the environmental protection measures and conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.

B. GENERAL CONDITIONS :

- i. The project authorities shall strictly adhere to the stipulations made by the State Pollution Control Board
- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.



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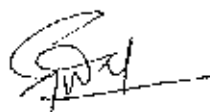
- iii. At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.
- iv. The project authorities shall strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989 as amended in 2003. Authorization from the SPCB shall be obtained for collection, treatment, storage, and disposal of hazardous wastes.
- v. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- vi. Occupational Health surveillance programme should be undertaken as regular exercise for all the employees, specifically for those engaged in handling hazardous substances. The first aid facilities in the occupational health centre should be strengthened and the medical records of each employee should be maintained separately.
- vii. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis.
- viii. Usage of PPEs by all employees/ workers shall be ensured.
- ix. The company shall strictly follow all the recommendations mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).
- x. The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.
- xi. The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report. All the

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recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented.

- xii. The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local villages and administration
 - xiii. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval.
 - xiv. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
 - xv. The implementation of the project vis-à-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.
 - xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
 - xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
6. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
7. The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.



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8. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.



(Sanchita Jindal)
Additional Director

Copy to:

1. The Secretary, Department of Environment and Forests, Government of Andhra Pradesh, Secretariat, Hyderabad- 500 022, A.P.
2. The Chief Conservator of Forests, Regional Office (Southern Zone) , Ministry of Environment & Forests, Kendriya Sadan ,4th Floor , C&F Wing, 17 Main Road, II Block , Kormangla, Bangalore- 560 034, Karnataka.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, A.P. Pollution Control Board, Paryavaran Bhawan, A-3, Industrial Estate, Sanath Nagar, Hyderabad- 500 018, A.P.
5. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Guard File.
7. Monitoring File.
8. Record File.

(Sanchita Jindal)
Additional Director

F. No. J-11011/619/2009 - IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi - 110 003

E-mail : pb.rastogi@nic.in
Telefax : 011: 2436 7668
Dated 14th February, 2012

To, ✓
Shri Jeswanth Reddy
Sr. Vice President & Factory Manager,
M/s Sree Rayalaseema Alkalies and Allied Chemicals Ltd.
Village Gondiparla, Mandal Kurnool,
District Kurnool, Andhra Pradesh

E-mail : sraaciab@rediffmail.com ; Fax : 08518-280098.

Subject: Expansion by adding Chloromethanes Plant at Sy. No. 61, 62 B, 63 Village Gondiparla, Mandal Kurnool, District Kurnool, Andhra Pradesh by M/s Sree Rayalaseema Alkalies and Allied Chemicals Ltd. - Environmental Clearance req.

Ref. : Your letter no. SRAAC/CMS/QAD/3 dated 2nd November, 2010.

Sir,

Kindly refer your letter dated 2nd November, 2010 alongwith project documents including Form I, Terms of References, Pre-feasibility Report, EIA/EMP Report and subsequent communications vide your letters dated 20th September, 2011 regarding above mentioned subject.

2.0 The Ministry of Environment and Forests has examined the application. It is noted that the proposal is for expansion by adding Chloromethanes Plant at Sy. No. 61, 62 B, 63 Village Gondiparla, Mandal Kurnool, District Kurnool, Andhra Pradesh. Tungabhadra River is located at 1.5 Km. Project cost is Rs. 97.9 Crores. Total land available is 305 acres. Gadidmadugu reserve forest is located at 5.5 Km. No ecological sensitive area is located within 10 km from the plant site. Following products will be manufactured:

S. N.	Products	Production (TPD)
1	Methyl Chloride	0.45
2	Methylene Chloride	61
3	Chloroform	56
By products:		
1	Carbon Tetrachloride (as a waste gas)	7.6 (to be incinerated)
2	Hydrochloric acid	23.5

3.0 HCl emissions from the chloromethane process will be scrubbed. Carbon tetra chloride gas produced from the process will be incinerated. Total fresh water requirement from Tungabhadra River source will be increased from 9,768.65 m³/day to 10,606.65 m³/day after expansion. Wastewater will be segregated into three effluent streams (i.e. castor oil & sewage; caustic soda plant and CPP) and treated in the effluent treatment plant (ETP). ✓

Treated effluent will be recycled/reused within the factory premises. Silica gel and calcium chloride will be sent to the existing captive secured landfill site. Boiler ash will be sold to cement manufacturers.

4.0 Public hearing of the project was exempted as per 7 (ii) of EIA Notification, 2006.

5.0 All synthetic organic chemical industries located outside the notified industrial estate/area are listed at S.N. 5(f) under category 'A' and appraised at Central level.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 6th, 18th and 28th meetings held during 14th December, 2009, 20th-21st January, 2011 and 20th-21st October, 2011 respectively. The Committee recommended the proposal for environmental clearance.

7.0 Based on the information submitted by the project proponent, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006, subject to the compliance of the following Specific and General Conditions:

A. SPECIFIC CONDITIONS:

- i) All the specific conditions and general conditions specified in the earlier environmental clearance letter accorded vide Ministry's letter no. 11011/653/2007-IA-II dated 26th December, 2007 shall be implemented.
- ii) National Emission Standards for Organic Chemicals Manufacturing Industry issued by the Ministry vide G.S.R. 608(E) dated 21st July, 2010 and amended time to time shall be followed by the unit.
- iii) Instead of the earlier proposal of having the different section of the proposed Chloromethanes plant in 3 different locations, the complete plant of chloromethane shall be installed at one location in the adjacent site measuring about 4 acres.
- iv) Production of chloromethane shall start only after the Incinerator is ready for incineration of Carbon tetra chloride gas.
- v) As proposed, HCl emissions from the chloromethane shall be absorbed in demineralised (DM) water in graphite absorption column to produce HCl (30%). After recovery of HCl, tail gases shall be passed through water scrubber to absorb the traces of HCl. Concentrated acid to be sold as by product.
- vi) The gaseous emissions (SO₂, NO_x, Cl₂ and HCl) and particulate matter from process stack shall conform to the norms prescribed by the CPCB/ APPCB from time to time. At no time, the emission levels shall go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly.
- vii) All necessary steps shall be taken for monitoring of chlorine as well as VOCs in the new plant. ✓

- viii) Carbon tetra chloride produced as waste gas shall be incinerated in an incinerator.
- ix) As proposed, steam requirement shall be met from existing co-generation unit.
- x) Ambient air quality data shall be collected as per NAAQES standards notified by the Ministry vide G.S.R. No. 826(E) dated 16th September, 2009. The levels of PM_{2.5}, SO₂, NO_x, CO, Cl₂, HCl, HC and VOCs shall be monitored in the ambient air and displayed at a convenient location near the main gate of the company and at important public places. The company shall upload the results of monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional office of MOEF, the respective Zonal office of CPCB and the AP Pollution Control Board (APPCB).
- xi) In plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Fugitive emissions shall be controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system shall be provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored. The emissions shall conform to the limits stipulated by the APPCB.
- xii) For further control of fugitive emissions, following steps shall be followed :
 1. Closed handling system shall be provided for chemicals.
 2. Reflux condenser shall be provided over reactor.
 3. System of leak detection and repair of pump/pipeline based on preventive maintenance.
 4. The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.
 5. Cathodic protection shall be provided to the underground solvent storage tanks.
- xiii) The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.
- xiv) Incinerator alongwith its pollution control device shall be designed as per CPCB guidelines. After installation of incinerator, a performance evaluation study shall be carried out and report shall be submitted to the respective regional office of the Ministry, CPCB and APPCB.
- xv) Total fresh water requirement from Tungabhadra River source after expansion shall not exceed 10,606.65 m³/day and prior permission shall be obtained from the concerned authority. A copy of permission shall be submitted to the Ministry's Regional Office at Bangalore. No ground water shall be used.
- xvi) As proposed wastewater shall be segregated into three effluent streams (i.e. castor oil & sewage; caustic soda plant and CPP) and treated in effluent treatment plant. Treated effluent shall be recycled/reused within the factory premises. Performance evaluation study of the existing ETP shall be carried out and report shall be submitted to the respective region office of the ministry and

CPCB. Treated effluent shall be collected in the guard pond. Regular water quality monitoring of guard pond shall be carried out.

- xvii) Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through dedicated guard pond.
- xviii) As proposed, silica gel and calcium chloride shall be sent to the captive secured landfill site.
- xix) Captive secured landfill site shall be designed as per CPCB guidelines. A performance evaluation study for the existing captive secured landfill site shall be carried out and report shall be submitted to the respective regional office of the MoEF, CPCB and APPCB within three months. All the recommendations made in the study shall be implemented.
- xx) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All Transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.
- xxi) Piezometer wells shall be installed around secured landfill. Ground water monitoring shall be carried out in every three months and trend analysis shall be carried out and report shall be sent to the CPCB and APPCB.
- xxii) As proposed, no storage of fly ash shall be done at site and fly ash shall be directly transferred from the silo in a well designed covered trucks.
- xxiii) Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 as amendment in 2003. Fly ash shall be provided to cement and brick manufacturers for further utilization. Bottom boiler ash shall be used for landfill of the low lying area and also permission from APPCB shall be obtained.
- xxiv) Rice husk storage shall be done in such a way that it does not get air borne or fly around due to wind. As proposed, rice husk & coal storage yard shall be properly covered.
- xxv) Dedicated parking facility for loading and unloading of material shall be provided in the factory premises. Unit shall develop and implement good traffic management system for their incoming and outgoing vehicles to avoid congestion on the public road.
- xxvi) Good sanitary facility shall be provided for truck drivers/workers.
- xxvii) As proposed, greenbelt shall be developed in 89.03 ha out of total land 152.40 ha, as per the CPCB guidelines. Time bound action plan shall be submitted to the Ministry and its respective Regional Office to achieve 89.03 ha. greenbelt within 5 years.
- xxviii) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling.
- xxix) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

- xxx) General housekeeping and cleanliness at the plant site shall be improved.
- xxxi) Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.

B. GENERAL CONDITIONS:

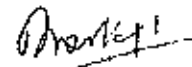
- i. The project authorities shall strictly adhere to the stipulations made by the A.P. Pollution Control Board.
- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- iii. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.
- iv. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- v. The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.
- vi. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.
- vii. Usage of Personnel Protection Equipments (PPEs) by all employees/ workers shall be ensured.
- viii. The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing relating to the project shall be implemented.

- ix. The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villages and administration.
- x. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.
- xi. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
- xii. The company shall earmark sufficient funds to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
- xiii. A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from who suggestions/ representations, if any, were received while processing the proposal.
- xiv. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the AP Pollution Control Board. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.
- xv. The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.
- xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
- xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. (~

9.0 The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.

10.0 The above conditions will be enforced, Inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 1989/2003/ 2008 and the Public Liability Insurance Act, 1991 alongwith their amendments and rules.



(Dr. P. B. Rastogi)
Director

Copy to:-

1. The Principal Secretary, Department of Environment, Forest, Science & Technology, Government of Andhra Pradesh, Hyderabad, A.P.
2. The Chief Conservator of Forests, Regional Office (Southern Zone, Bangalore) Kendriya Sadan, 4th Floor, E&F Wing, II Block Koramangala, Bangalore-560034.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, Andhra Pradesh Pollution Control Board, Paryavaran Bhavan, A-III, Industrial Estate, Sanath Nagar, Hyderabad - A.P.
5. Adviser, IA II(I), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard File/Monitoring File/Record File.



(Dr. P. B. Rastogi)
Director

14/2/12



**RENEWAL OF CONSENT & AUTHORISATION ORDER
BY REGISTERED POST WITH ACKNOWLEDGEMENT DUE**

Consent Order No : APPCB/KNL/KNL/16332/CEO&HWA/HO/2014-6628 Date: 26.02.2014

(Consent Order for Existing/New or altered discharge of sewage and/or trade effluents/outlet under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof, Operation of the plant under section 21/22 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation / Renewal of Authorisation under Rule 5 of the Hazardous Wastes (Management, Handling & Transboundary, Movement) Rules 2008 & Amendments thereof).

CONSENT is hereby granted under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974, under section 21/22 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof, and Authorisation under the provisions of HW (MH & TM) Rules, 2008 (hereinafter referred to as 'the Acts', 'the Rules') and amendments thereof and the rules and orders made there under to **M/s. Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparala Village, Kurnool Mandal, Kurnool District - 518 004 E-mail: sraaclab@rediffmail.com** (hereinafter referred to as 'the Applicant /Industry') and is authorized to operate the industrial plant to discharge the effluents from the outlets and the quantity of Emissions per hour from the chimneys, by operating pollution control equipment, as detailed below.

i) Out lets for discharge of effluents:

Outlet No.	Unit	Effluents in KLD	Quantity in KLD	Method of Treatment and Disposal
1	Chloro Alkali plant	Process and washings - 97.5 KLD Cooling tower blow down / chelating tower rejects / gland seal - 82.5 KLD	180	After treatment in ETP, on land for gardening.
		Domestic waste water after septic tank	85	
2	Castory oil / Fatty Acid plant	Process and washings - 50 KLD Cooling tower blow down / chelating tower rejects & Boiler blow down - 120 KLD	170	After treatment in ETP, on land for gardening.
3	Co -Gen. plant	Process and washings - 220 KLD, + Cooling tower blow down / chelating tower rejects / gland seal -150 KLD, + Boiler blow down / regeneration water - 50 KLD	420	After treatment in ETP, on land for gardening.
		DM plant for generation / RO rejects	330	Recycled back into the process for brine makeup.

Continued... p/2

ii)) Emissions from chimneys:

Chimney No.	Description of Chimney
1.	Attached to Oil / H2 fired Thermax boiler – 4 TPH
2.	Attached to Oil fired boiler – 3 TPD
3.	Attached to 4 x 3 TPH Waste heat recovery boiler attached to D.G set – 4 x 6.2MW
4.	Attached to Husk fired boiler – 12 TPH
5.	Attached to Oil fired AIEC boiler – 3 TPH
6.	Attached to Coal fired HLL boiler – 42 TPH
7.	Attached to Coal fire boiler – 100 TPH
8.	Attached to Salt furnace – 15 Lakh K.Cal./hr. - 2 Nos
9.	Attached to Thermopack unit – 20 Lakh K.Cal./hr.
10.	Attached to D.G sets - 500 KVA - 2Nos.
11.	Tail vents (Chlorine & HCl)

iii) APPCB/KNL/KNL/16332/CFO&HWA/HO/2014 HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 5 (4)] of Hazardous Wastes (Management, Handling & Transboundary, Movement) Rules 2008 & Amendments thereof.

M/s. Sree Rayalaseema Alkalies & Allied Chemicals Ltd., Gondiparla, Kurnool District is hereby granted an authorisation to operate a facility for collection, reception, storage, transport and disposal of the following wastes with quantities as below:

• HAZARDOUS WASTES WITH DISPOSAL OPTION AS PER THE CFO ORDER DATED :

S.No	Name of the Hazardous waste	Stream	Quantity of Hazardous waste	Disposal Option
1.	Process (brine sludge)	16.2 of Schedule-I	16TPD	Dispose in the onsite secured land fill complying to CPCB guidelines.
2.	ETP (sludge)	34.3 of Schedule-I	68 TPA	TSDF, Dundigal, Rangareddy District for secured land filling*.
3.	Glycerin Pitch	5.2 of Schedule-I	10 TPD	Incineration in Furnace followed by Boiler at temp. above 1000 °C / authorized cement plants for co processing.

* The RO, Kurnool shall collect the samples of ETP sludge generated in the industry for comprehensive analysis to verify applicability of the HWM rules.

Continued .. p/3

• **HAZARDOUS WASTES WITH RECYCLING OPTION:**

S.No	Name of the Hazardous waste	Stream	Quantity of Hazardous waste	Disposal Option
1.	Process (spent catalyst)	35.2 of Schedule-I	1.0 TPD	Should be sent back to the manufacturers for reprocessing / TSDF, Dundigal.
2.	Process (spent earth)	35.3 of Schedule-I	2.0 TPD	Authorized recyclers/preprocessors.
3.	Fatty acid pitch & residue	5.2 of Schedule-I	7.5 TPD	
4.	Furnace oil sludge	5.2 of Schedule-I	31.68 TPA	Incineration in Furnace followed by Boiler at temp. above 1000 °C / authorized cement plants for co processing.
5.	Waste oil	5.1 of Schedule-I	3.0 TPA	Authorized recyclers/preprocessors.

This consent order is valid for the manufacture of quantities of each product as mentioned below only.

S.No.	Product	Quantity in TPD
1	Caustic soda lye	520
2	Caustic soda flakes	
3	Potassium Hydroxide / Caustic soda	
4	Potassium Carbonate	50
5	Liquid chlorine	300
6	Hydrochloric Acid (100% C12 basis)	186
7	Barium sulphate	05
8	Sodium hypochloride (100% C12 basis)	10
9	Calcium Hypochlorite (100% C12 basis)	10
10	Calcium sulphate	02
11	Hydrogenated Castor oil	100
12	a) 12-Hydroxy Stearic Acid (or) b) Methyl 12-hydroxy stearate (or) c) Ricinolic Acid.	60
13	Dehydrated Castor Oil	10
14	NN BIS Amide	05
15	Bio - Diesel	10
16	a) Glycerine (crude) b) Glycerine refined	75
17	Distilled Fatty Acid	20
18	Stearic Acid	35
19	Sodium Sulphate	06
20	Soap Noodles	100
21	Toilet soaps & Bathing Bars	50
22	Captive power plant (D.G sets)	24.8 MW (4 x 6.2MW) (stand by)
23	Hydrogen	25,253 m ³ /day
24	Electricity (coal based)	45 MW (21 MW+ 24 MW)

This order is subject to the provisions of 'the Acts' and the Rules' and orders made thereunder and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

Continued... p/4

This combined order of consent & Hazardous Waste Authorisation should be valid for a period ending with the 28th day of February 2016.

Sd/-
MEMBER SECRETARY

✓ To

M/s. Sree Rayalaseema Alkalies & Allied Chemicals Limited,
Gondiparla (V), Kurnool (M)
Kurnool District - 518 004

// T.C.F.B.O //


CHIEF ENVIRONMENTAL ENGINEER

SCHEDULE - A

1. The applicant shall make applications through online for renewal of Consent (under Water & Air Acts) and Authorisation under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts for obtaining Consent & HW Authorisation of the Board.
2. This order is issued in line with Board's CFE order dated 07.05.2008 & 03.12.2008. Concealing the factual data or submission of false information/ fabricated data and failure to comply with any of the conditions mentioned in this order may result in withdrawal of this order and attract action under the provisions of relevant pollution control Acts.
3. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to such authority (hereinafter referred to as the Appellate Authority) constituted under Section 28 of the Water (Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.
4. The facility may explore the possibility of tapping the solar energy for their energy requirements.
5. All other conditions stipulated in the Schedule - A of the earlier combined CFO & IWA order No :APPCB/KNL/KNL/231/HO/CFO/2011-2301, dated 25.10.2011 remains same. The industry should ensure consistent compliance of the condition of Schedule-A.
6. The industry shall comply with the all the directions issued by the Board from time to time.
7. The Board reserves its right to modify above conditions or stipulate any further conditions and to take action including revoke of this order in the interest of protection of public health and environment.

Continued... p/5

SCHEDULE - B

1. The effluent discharged should not contain constituents in excess of the tolerance limits mentioned below.

Outlet	Parameter No.	Limiting Standards
1 to 3.	pH	5.50 - 9.00
	Total Suspended Solids (TSS at 103 - 105 °C)	200 mg/l
	Oil and Grease	10 mg/l
	Biochemical Oxygen Demand (BOD 3 at 27 °C)	100 mg/l
	Chemical Oxygen Demand (COD)	250 mg/l

2. The industry should take steps to reduce water consumption to the extent possible and consumption should NOT exceed the quantities mentioned below:

S.No	Purpose	Chloro Alkali plant (in KLD)	Castory oil / Fatty Acid plant (in KLD)	Co - Gen plant (in KLD)
1.	Process & washings	342.5	85	--
2.	DM Water including DM Plant for regeneration water and filter back wash	387.5	--	360
3.	Pump gland cooling	60	10	--
4.	Cooling (makeup) / humidification / water spraying)	1050	210	6050
5.	Floor Washings	40	6	30
6.	Domestic	100	6	60
Total		1,980 KLD	317 KLD	6500 KLD

3. The industry shall file the water cess returns in Form-I as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5th of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water cess as per the assessment orders as and when issued by Board. The industry shall provide separate water meters with necessary pipeline for assessing the quantity of water used for each of the purposes as per Cess Form-I.
3. The emissions should not contain constituents in excess of the prescribed limits mentioned below.

Chimney No.	Parameter	Emission Standards
1 to 6	SPM	115 mg/Nm ³
7	SPM	100 mg/Nm ³
8	SPM	115 mg/Nm ³
	HCl mist	35 mg/Nm ³
	Chlorine	15 mg/Nm ³
9 & 10	SPM	115 mg/Nm ³
11	Tail vents (Chlorine & HCl)	The sniff Cl ₂ from different Cl ₂ handling sections is collected under suction and sent to Cl ₂ neutralization section. The Cl ₂ gas is scrubbed in dilute Sodium Hydroxide solution in two absorption towers to make sodium Hypo-chlorite. A closed circuit scrubbing system installed to take care of any accidental leakage from chlorine storage and filling area. Cl ₂ sensors are also provided at Cl ₂ handling section. Water scrubber is installed to scrub the tail gas vents of HCl plant

4. The industry should comply with emission limits for DG sets of capacity upto 800 KW as per the Notification G.S.R.520 (E), dated 01.07.2003 under the Environment (Protection) Amendment Rules, 2003 and G.S.R.448(E), dated 12.07.2004 under the Environment (Protection) Second Amendment Rules, 2004. In case of DG sets of capacity more than 800 KW should comply with emission limits as per the Notification G.S.R.489 (E), dated 09.07.2002 at serial no.96, under the Environment (Protection) Act, 1986.
5. The industry should comply with ambient air quality standards of PM₁₀ (Particulate Matter size less than 10µm) - 100 µg/ m³; PM_{2.5} (Particulate Matter size less than 2.5 µm) - 60 µg/ m³; SO₂ - 80 µg/ m³; NO_x - 80 µg/ m³, outside the factory premises at the periphery of the industry.
Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.B-29016/20/90/PCI-I, dated 18.11.2009
Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
Night time (10 PM to 6 AM) - 70 dB (A).
6. The industry should not produce beyond the permitted capacity as mentioned in this order, without obtaining prior CFE & CFO of the Board.
7. The industry should maintain continuous monitoring equipment to air pollution control equipment and connect the data to APPCB website within one month and report the compliance to RO, Kurnool, as committed vide lr.dt.02.12.2013.
8. The industry shall store Coal, Husk and Husk-ash in closed sheds only, as committed.
9. The industry shall provide continuous temperature recorder with recording facility for recording temperature of Furnace provided for incineration of Glycerin pitch, within one month and maintain records. They shall submit compliance report to the RO, Kurnool.
10. The industry shall provide pumping facility to transfer the leachate of landfill to ETP for treatment and disposal, within a month.
11. The industry shall earmark an amount of Rs. 1.29 Crores per annum (i.e, 0.2 % of project cost) for 10 years towards the Enterprise Social Responsibility (ESR) activities and spend the amount in Local area.
12. The industry shall conduct HAZOP studies & HAZID studies within 3 months and submit report to the Board.
13. The Expert committee will study the issue of transferring waste stored in the pits to the newly constructed landfill. The industry shall comply with the recommendations of the committee.
14. The industry should provide & maintain piezometric wells around the existing and new landfill site. Proper records shall be maintained.
15. The industry should store the raw materials in closed sheds only.
16. The industry is permitted to store treated waste water in guard ponds during rainy season / unavoidable circumstances only. The guard pond should be have proper lining away from river Tungabhadra towards Northern direction.
17. The industry should install chlorine sensors near cylinder storage and filling sections.
18. The industry should regularly carry out ground water quality monitoring around the landfill and submit the reports every months to RO, Kurnool.
19. The wastewater generation for tonne of Caustic soda produced should not exceed more than 1 m³ (Excluding cooling tower blow down).
20. Thick green belt should be developed & maintained by the industry with tall growing trees in the vacant spaces of the unit as per the norms.
21. The industry should establish appropriate Rain Water Harvesting structure on the available up-stream portion of the plant site.
22. The industry should provide separate water meters with necessary pipeline for assessing the quantity of water used for each of the purposes mentioned below.
 - a. Industrial cooling, boiler feed.
 - b. Domestic purposes.
 - c. Processing, whereby water gets polluted and pollutants are easily biodegradable.
 - d. Processing, whereby water gets polluted and pollutants are not easily biodegradable.

Continued... p/7

23. The applicant should submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.

SCHEDULE - C

[see rule 5(4)]

[CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]

1. The industry shall give top priority for waste minimization and cleaner production practices.
2. The industry shall not store hazardous waste for more than 90 days as per the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and amendments thereof. The industry shall maintain 6 copy manifest system for transportation of waste generated and copies of receipt of Consignee shall be submitted to the Concerned Regional office. The industry shall maintain proper records for Hazardous Wastes stated in Authorisation in FORM-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form- 4 as per Rule 22(2) of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and amendments thereof.
3. The industry shall dispose /sell the Hazardous Waste to only industries/agencies authorized by the State Pollution Control Boards. The industry shall verify the authorization of the Board given to the Party before disposing its waste to the External Party.
4. The industry shall maintain proper records for Hazardous Wastes disposal and its concurrence with authorization. In case of variation in generation, industry shall submit explanation and obtain amendment in Environmental Clearance/ CFE/CFO in this regard.
5. The industry shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal. Waste oils shall be disposed to the authorized Reprocessors/ Recyclers and Used Lead Acid Batteries shall be disposed to the manufacturers / dealers on buyback basis. The industry shall take necessary practical steps for prevention of oil spillages and carry over of oil from the premises. The industry shall check the Certificate/ Authorisation/order of MoEF issued to the Re-user/Recycle units while disposing the waste oil.
6. The industry shall dispose of e-waste to the authorised recyclers only.
7. The industry shall maintain good house keeping.
8. The industry shall submit the condition wise compliance report of the conditions stipulated in Schedule B & C of this Order on half yearly basis to Board Office, Hyderabad and concerned Regional Office.

Sd/-
MEMBER SECRETARY

✓ To
M/s. Sree Rayalaseema Alkalies & Allied Chemicals Limited,
Gondiparla (V), Kurnool (M),
Kurnool District - 518 004.

// T.C.F.B.O //


CHIEF ENVIRONMENTAL ENGINEER



ANDHRA PRADESH POLLUTION CONTROL BOARD

Paryavarana Bhavan, A-III, Industrial Estate,

Sanathnagar, Hyderabad-500 018

Phone : 040-23887500, Website : www.appcb.ap.nic.in

AUTO RENEWAL OF CONSENT AND AUTHORISATION ORDER FOR OPERATIONS

In response to your application dated 25.02.2016 for Auto Renewal of Consent for operation and Authorisation Order, the Board is hereby extending validity period of Consent and Authorisation order given under sections 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 and 21 of the Air (Prevention and Control of Pollution) Act, 1981 and Authorisation under Rule 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, issued vide Consent order No. APPCB/KNL/KNL/16332/CFD&HWA/HO/2014-6628 dt.26.02.2014 with valid upto 28.02.2016, for further period of 5 (FIVE) years i.e., upto 28.02.2021.

R.V.N. P. 4/3/16
For A.P. POLLUTION CONTROL BOARD

Dated: 04.03.2016

To

The Occupier

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd.,

Gondiparla (V),

Kurnool District - 518 004.



**BY REGD. POST WITH ACKN. DUE
CONSENT & AUTHORISATION ORDER**

Consent Order No : APPCB/KNL/KNL/16332/CF&HWA/ HO/2015-

Date :28.10.2015

(Consent Order for Existing/New or altered discharge of sewage and/or trade effluents/outlet under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof, Operation of the plant under section 21 of Air (Prevention & Control of Pollution) Act 1981 and amendments thereof and Authorisation under Rule 5 of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules 2008 & Amendments thereof.

CONSENT is hereby granted under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974, under section 21 of Air (Prevention & Control of Pollution) Act 1981 and Authorisation under the provisions of HW (MH & TM) Rules, 2008 (hereinafter referred to as 'The Acts', 'the Rules') and the rules and orders made thereunder to

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District.
E-mail: sracslab@rediffmail.com

(Hereinafter referred to as 'the Applicant') authorizing to operate the industrial plant to discharge the effluents from the outlets and the quantity of emissions per hour from the chimneys as detailed below:

i) Out lets for discharge of effluents:

Outlet No.	Unit	Outlet Description	Max Daily Discharge in KLD	Point of Disposal
1	11 MW Power Plant	Boiler blow down & Cooling tower bleed off-180 KLD + Washings DM plant & RO rejects - 75 KLD	255 KLD	Onland for gardening after treatment.
2	Chloro Methane plant	Cooling tower blow down & Scrubber blow down	57 KLD	Shall be treated in the existing ETP of Chloro alkali plant for further treatment and disposal. The treated waste water shall be further treated through UF & RO Plant. The RO rejects shall be recycled to Brine Plant and the RO Permeate shall be reused as process water.
3		Domestic	10 KLD	Septic tank followed by soak pit

ii) Emissions from chimneys:

Chimney No.	Description of Chimney
Power plant (33 MW)	
1	Stack attached to coal fired boiler of capacity - 110 TPH
Chloro methane plant	
2	Stack attached to LPG/Hydrogen gas fired incinerator of capacity - 343 Kgs/hr

III) HAZARDOUS WASTE AUTHORISATION (FORM - II) [See Rule 5 (4)]:

M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited, Sy.No. 61, 62A, 62B, 63 & 64, Gondiparla (V), Kurnool (M), Kurnool District is hereby granted an authorization to operate a facility for collection, reception, storage, treatment, transport and disposal of Hazardous Wastes namely:

• HAZARDOUS WASTES WITH DISPOSAL OPTION:

Sl. No.	Name of hazardous waste	Quantity	Stream	Disposal option
1.	Calcium Chloride	0.02 TPD	16.2 of Schedule-1	Shall be sent to secured land fill.
2.	Silica gel	0.018 TPD	16.2 of Schedule-1	Shall be sent to secured land fill.
3.	Bottom residue	0.50 TPD	20.3 of Schedule-1	Shall be incinerated along with Carbon Tetra Chloride in the incinerator.
4.	Carbon Tetra Chloride	7.5 TPD	16.2 of Schedule-1	Shall be incinerated in the onsite incinerator or shall be sold to Cypermethrin manufacturing units as a feed stock.
5.	Caustic scrubbing (Lean Brine)	7 KLD	34.1 of Schedule-1	Shall be sent for brine make up.

This consent is valid for manufacture of quantities of each product as mentioned below only.

Sl. No.	Products	Quantity
Chloro Methane Plant:		
1.	Methyl Chloride	0.45 TPD
2.	Methylene Chloride	61 TPD
3.	Chloroform	56 TPD
By-Products		
4.	Carbon Tetrachloride (as waste gas)	7.6 TPD
5.	Hydrochloric acid	23.5 TPD
Thermal Power Plant:		
6.	Electricity	31 MW (From existing 45 MW (21+24 MW) Coal based to 76* MW)

*There shall not be any additional generation of Thermal Power. The existing 31 MW furnace oil gas based generator sets shall be kept as standby and the equivalent 31 MW shall be generated as coal based turbine.

This order is subject to the provisions of 'the Acts' and the Rules' and orders made there under and further subject to the terms and conditions incorporated in the schedule A, B & C enclosed to this order.

This combined order of consent & Hazardous Waste Authorisation shall be valid for a period ending with the 31st day of August, 2016.

Sd/-
MEMBER SECRETARY

To
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District - 518 004.

/T.C.F.R.O//
10/10/15
JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head - IV)

SCHEDULE - A

1. The applicant shall make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts for obtaining Consent & HW Authorization of the Board.
2. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to such authority (hereinafter referred to as the Appellate Authority) as the State Government may think fit to constitute under Section 28 of the Water(Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air(Prevention and Control of Pollution) Act, 1981.
3. This order is issued in line with the Board's CFE order dt. 07.05.2008 & 10.04.2012. Concealing the factual data or submission of false information / fabricated data and failure to comply with any of the conditions mentioned in this order may result in withdrawal of this order and attracts action under the provisions of relevant pollution control Acts.
4. All the conditions stipulated in the Schedule - A of the earlier combined CFE & HWA order No: APPCB/KNL/KNL/231/HQ/CFE/2013-2301 dt.25.10.2011 remains same. The industry should ensure consistent compliance of each condition of Schedule-A.

SCHEDULE - B

1. The industry shall take steps to reduce water consumption to the extent possible and consumption shall NOT exceed the quantities mentioned below:

S. No	Purpose	Chloro Methane plant(In KLD.)	Power plant(In KLD.)
1	Boiler feed	-	640
2	Cooling Tower makeup	800	1050
3	Scrubber	20	-
4	Fresh water for 32% HCl	20	-
5	Domestic	10	-

3. Separate meters with necessary pipe-line shall be provided for Chloro Methane plant & Power plants for assessing the quantity of water used for boiler feed, cooling Tower makeup, Scrubber, Fresh water for 32% HCl and domestic.
4. The industry shall file the water Cess returns in Form-I as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5th of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water Cess as per the assessment orders as and when issued by Board.
5. The effluent discharged shall not contain constituents in excess of the tolerance limits mentioned below.

Outlet No.	Parameter	Limiting Standards
1	pH	5.5 - 9.0
	Suspended Solids	200.0 mg/l
	Oil & Grease	10.0 mg/l
	Biochemical Oxygen Demand (BOD)	100.0 mg/l

6. The emissions shall not contain constituents in excess of the prescribed limits mentioned below:

Chimney No.	Parameter	Emission Standards	Sampling duration
1	Particulate matter	50 mg/Nm ³	for 30 hours
	HCl	50 mg/Nm ³	for 30 hours
	SO ₂	200 mg/Nm ³	for 30 hours
	CO	100 mg/Nm ³	for 30 hours
		50 mg/Nm ³	for 24 hours
	Total Organic Carbon	20	for 30 hours
	HF	4	for 30 hours
	NO _x (NO and NO ₂ expressed as NO ₂)	400	for 30 hours
	Total dioxide and furans	0.1 ng TEQ/ Nm ³	for 8 hours
	Cd+Th+ their compounds	0.05 mg/Nm ³	for 2 hours
	Hg and its compounds	0.05 mg/Nm ³	for 2 hours
	Cd+As+Pb+Co+Cr+Cu+Mn+Ni+V+ their compounds	0.50	for 2 hours

7. The industry shall comply with ambient air quality standards of PM_{10} (Particulate Matter size less than $10 \mu m$) - $100 \mu g/m^3$; $PM_{2.5}$ (Particulate Matter size less than $2.5 \mu m$) - $60 \mu g/m^3$; SO_2 - $80 \mu g/m^3$; NO_x - $80 \mu g/m^3$, outside the factory premises at the periphery of the industry. Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.H-29016/20/90/PCI-I, dated 18.11.2009.
Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A)
Night time (10 PM to 6 AM) - 70 dB (A)
8. The industry shall not manufacture any product, other than those mentioned in this order, without CPE & CFO of the Board.
9. The industry shall not increase the capacity beyond the permitted capacity mentioned in this order, without obtaining CPE & CFO of the Board.
10. The industry shall install Online stack monitoring system for the stack attached to 110 TPH Boiler installed for 11 MW Power Plant within three months and connect the monitoring data to the web site of APPCB.
11. The industry shall connect the online monitoring data to the APPCB website immediately for the 2 No's of Online stack monitoring systems provided to 100 TPH & 42 TPH boilers in the power plant and also 2 Nos. of Online stack monitoring system in the Chloro Alkali Plant and submit the compliance to RO, Kurnool.
12. System of leak detection and repair of pump / pipeline shall be installed in the plant and immediate response team shall be identified for preventive maintenance.
13. The industry shall maintain the following records and the same shall be made available to the inspecting officers of the Board:
 - i. Daily production details, RG-I records and Central Excise Returns.
 - ii. Quantity of Effluents generated, treated and recycled
 - iii. Log books for pollution control systems.
14. The industry shall regularly operate Graphite Absorption column for absorption of HCl emissions generated from Chloro Methane plant to produce HCl with a concentration of 30%. The tail gases from the absorption column shall be further passed through water scrubber to absorb the traces of HCl.
15. The industry shall regularly operate the scrubber for scrubbing the flue gas emissions from the incinerator.
16. The industry shall not cause any air pollution / odour nuisance in the surrounding environment.
17. The industry shall further develop green belt in an area of 25 acres to achieve total green belt area of 220 acres as stipulated in the EC order dt. 14.02.2012.
18. The industry shall comply with the conditions stipulated in the Board's CPE order dt. 07.05.2008 & 10.04.2012.
19. The industry shall comply with the conditions stipulated in the EC order dated 26.12.2007 & 14.02.2012.
20. The proponent shall comply with all the directions issued by the Board vide order dt. 18.12.2014 & 24.02.2015.
21. The applicant shall submit Environment statement in Form V before 30th September of every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.
22. The Board reserves its right to modify above conditions or stipulate any additional conditions including revocation of this order in the interest of environment protection.
23. The conditions stipulated are without prejudice to the rights and contentions of this Board in any Hon'ble Court of Law.

SCHEDULE - C
[see rule 3(4)]

CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES

1. The industry shall give top priority for waste minimisation and cleaner production practices.
2. The industry shall not store hazardous waste for more than 90 days as per the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and amendments thereof.
3. The industry shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal.
4. The industry shall not dispose Waste oils to the traders and the same shall be disposed to the authorized Reprocessors/ Recyclers.
5. The industry shall dispose Used Lead Acid Batteries to the manufacturers / Dealers on buyback basis.
6. The industry shall take necessary practical steps for prevention of oil spillages and carry over of oil from the premises.
7. The industry shall maintain 6 copy manifest system for transportation of waste generated and a copy shall be submitted to Board Office and concerned Regional Office.

8. The industry shall maintain good house keeping & maintain proper records for Hazardous Wastes stated in Authorisation.
9. The industry shall maintain proper records for Hazardous Wastes stated in Authorisation in FORM-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form- 4 as per Rule 22(2) of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and amendments thereof.
10. The industry shall submit the condition wise compliance report of the conditions stipulated in Schedule A, B & C of this Order on half yearly basis to Board Office, Hyderabad and concerned Regional Office.
11. The industry shall dispose of e-waste to the authorised recyclers only.

Sd/-
MEMBER SECRETARY

To
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Limited,
Sy.No. 61, 62A, 62B, 63 & 64,
Gondiparla (V), Kurnool (M),
Kurnool District.

//T.C.F.B.O//

Kulso
28/10/15

JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head -IV)



ANDHRA PRADESH POLLUTION CONTROL BOARD

Paryavarana Bhavan, A-III, Industrial Estate,

Sanathnagar, Hyderabad - 500 018.

Phone : 040-23887500, Website: www.appcb.ap.nic.in

AUTO RENEWAL OF CONSENT AND AUTHORISATION ORDER FOR OPERATIONS

In response to your application dated 18.05.2016 for Auto Renewal of Consent for Operation and Authorisation order, the Board is hereby extending validity period of Consent and Authorisation order given under Section 25/26 of Water (Prevention and Control of Pollution) Acts, 1974 and 21 of the Air Prevention and Control of Pollution) Acts, 1981 and Authorisation Rules 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 issued vide consent order No. APPCB /KNL/KNL /16332/ CFO&HWA/HO/2015 dated 28.10.2015 valid upto 31.08.2016 for further period of 5(five) years i.e., upto 31.08.2021.

All other conditions mentioned in Schedules A, B & C of the combined CFO&HWA order issued by the Board vide order dated 28.10.2015 will remain same.

The industry shall submit the compliance report to all the stipulated conditions for Consent for Operation for every six months i.e. on 1st of January and 1st of July of every year.

Sd/-
MEMBER SECRETARY

Dated: 06.06.2016

To
The Occupier,
M/s. Sree Rayalaseema Alkalies and Allied Chemicals Ltd.,
Sy. No.61, 62A, 62B, 63&64, Gondiparla (V),
Kurnool District - 518 004.
E-mail: sraaclab@rediffmail.com

Copy to:

1. The JCEE, Zonal Office: Kurnool for information and necessary action.
2. The JCEE (Cess), UH:II, APPCB, Hyderabad for information.
3. The JCEE (HWM), UH:IV, APPCB, Hyderabad for information.
4. The Environmental Engineer, Regional Office, Kurnool for information and necessary action.

//T.C.F.B.O//

V. Ramesh Babu
JOINT CHIEF ENVIRONMENTAL ENGINEER
(Unit Head -IV)

SREE RAYALASEEMA ALKALIES AND ALLIED CHEMICALS LIMITED

**SY. NO. 51/1, 2A, 2B, 2C1, 2C2, 2C3, 56/1, 58/1, 59/1, 60,
62/3/2D2, 2C1/A2, 2C1/A3, 2C2/C, 2G/1, 2E, 2F, 1A, 1B, 62A,
62 B, 63, 64, 70/C2, 72/P, GONDIPARLA VILLAGE,
KURNOOL MANDAL AND DISTRICT, ANDHRA PRADESH**

STUDIES AND DOCUMENTATION BY

TEAM Labs and Consultants

QCI: MoE&F OM, List A-1, S.No.25.

(An ISO 9001:2008, ISO 14001:2004 &

OHSAS 18001:2007 Certified Organization)

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