

PREFEASIBILITY REPORT

FOR

PROPOSED INDUSTRIAL ESTATE

406.26 Acres

AT

VILLAGE: ATTIVARAM

TALUK: OZILI

DISTRICT: SRI POTTI SRIRAMULU NELLORE

STATE: ANDHRA PRADESH

BY



ANDHRA PRADESH INDUSTRIAL INFRASTRUCTURE CORPORATION LTD.

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1. INTRODUCTION

1.1 ABOUT THE PROJECT PROPONENT

Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC), an undertaking of Govt. of Andhra Pradesh, is a premier organization in the state, vested with the objective of providing Industrial infrastructure through development of Industrial Parks and Special Economic Zones. Over 320 Industrial Parks have been established throughout the State, covering an extent of over 1,30,000 acres. The Industrial Parks and Special Economic Zones are playing a pivotal role, in attracting investments to the State both domestic & foreign by providing multiple incentives. Andhra Pradesh Industrial Infrastructure Corporation Ltd. was formed in 1973 by the GO No: 831 dated 10-SEP-1973 issued by Government of Andhra Pradesh.

- APIIC is spread over in all districts of A.P having 15 Zonal Offices.
- APIIC has manpower of all sectors including Administration, Engineering & Quality Assurance, Legal, Marketing, Finance & Internal Audit etc.,
- APIIC will undertake infrastructure development in its Industrial parks and takes up regular maintenance.
- APIIC is also delegated with Local Authority Powers under Panchayat Raj & Municipal Act by GoAP.

1.2 OBJECTIVE OF APIIC

Andhra Pradesh Industrial Infrastructure Corporation (APIIC) is the premier Organization in the state of Andhra Pradesh, vested with the objective of providing Industrial Infrastructure through the development of Industrial Areas. The corporation has so far developed over 320 Industrial Parks. The Corporation is also developing sector focused Parks, Textiles processing parks, Leather parks in the state of Andhra Pradesh.

1.3 ABOUT THE PROJECT

APIIC proposes the development of Industrial Park at Attivaram village, Ozili mandal, Sri Potti Sriramulu Nellore District in Andhra Pradesh. The park is

proposed to be spread over 406.26 acres and cater to the socio-economic development of the region..

Hence the site attracts Environmental Clearance from the Ministry of Environment and Forests Expert Appraisal Committee, as per Schedule 7(c) category A project, as per the guidelines of EIA notification of 2006, and the amendments thereafter.

1.4 MARKET DEMAND

It is seen that Food and agro based industry, followed by Engineering based are the dominant groups of industries in the district, in terms of number of units, investment and employment,

The District has 38 Large and Medium Industries in the sectors such as Sugar cane crushing, Prawn Processing, Shrimp feed, Drugs, Pharmaceuticals, Dry Batteries, Carbon Electrodes, Beverages, Textiles, Dairy Units, Aluminum Cans, Rubber, Mould Caps, Iron Castings etc. M/s Asian Peroxide Ltd and Gayathri Sugars Ltd. are predominant industries.

1.4.1 Agro Industries

Agriculture is the main occupation of the people of the district. Rice is the staple food of the people and paddy is the principal food crop followed by bajra, jowar and ragi crops. Tobacco, Groundnut, Chillies, Sesamum, Sugarcane are also mainly cultivated. Based on the available agricultural produce, a variety of agro based Industries such as rice bran oil plants, sugar factories, rice and paraboiled rice mills have come up There is also potential for these industries in the district.

1.4.2 Mineral Resources

Mica, Quartz, Feldspar, Vermiculite and Barytes. Other major constituents are Silica Sand and Lатарite occurring in major parts of the District. The most important mineral produced and exported from the district is mica. Three varieties of mica namely white, ruby and green are obtained. The production of minerals in 2010-11 is given in Table 1-1

Table 1-1 Mineral Production in 2010-11

S.No.	Mineral	Production in Tonnes
1	Barytes	2669
2	Silica Sand	1912409
3	Feldspar	77502
4	Mica	8947
5	Quartz	60667
6	Vermiculate	16467
7	Laterite	108540

SOURCE:- AP Handbook of Statistics, 2011-12, Govt of AP.

The other minerals found are Quartz, Silica sand, Lime shell, Lime kankar, Barytes, Copper ore, Vermiculite and china clay. Based on these minerals a few Industries both in Large, Medium and SSI sectors have come up. Still there is scope to set up similar types of industries.

Lime shell occurs along the borders of the Pulicat Lake. It can be commercially utilised in lime calcination plants for production of pure hydrated lime, which is in great demand for use in various chemicals and as bleaching powder.

Barytes is noticed near Vinjamur mandal. Lime stone of gray and pink colour is also reported to exist in Vinjamur mandal.

Considerable deposits of quartz of purity up to 98% silica are available in Rapur, Giddalur and Chaganam villages West of Gudur.

Extensive deposits of glass grade silica sand occur in Momidi, Chintavaram, Ballavolu of Gudur mandal, Chittamur Mandal and in Pannamgadu village of Tada mandal.

Vermiculite is available at Rachapalem, Tippareddypalli and Ramarangapuram of Gudur Mandal, Mittatmakur and Gatlapaem of Rapur Mandal. These minerals can support the development of Glass Industries, Barium based chemicals manufacturing industries, ceramic based industries.

1.4.3 Marine Resources

Nellore district has a long Coast line With $\text{\textcircled{S}}$ campi?under cultivation, farmers are having a good time in the aquaculture. Fish is also available in plenty and good

number of aqua processing plants, feed mills and ice plants are existing in the district.

1.4.4 Forest resources:

The main forest produces are timber, bamboo, cashew nut, honey and firewood. A few units can be set up utilising the available cashew nut. The minor forest produce are broom grass, tamarind and soap nuts.

1.4.5 Handloom & Handicrafts

Nellore district has many traditional handloom and handicraft clusters, some of which are dying clusters.

The Leather puppets of Udayagiri , saw dust stuffed dolls and wooden chariots of Varigonda, Thunga mats, and wooden cutlery cluster of Udayagiri, palm leaf products (Garlands, hats, waste paper baskets, trays, artificial flowers, mats, etc) of Venkateswara nagar and fabric paintings of Thummur (Naidupet) are traditional handicraft clusters in the district.

Nellore district is famed for its handlooms. Venkatagiri and Paturu saris are famed for their zari (brocade work), texture and colours.

2. PROJECT PROFILE

2.1 LOCATION OF THE SITE

The District is divided into 46 Mandals, covering three Revenue Divisions with Head Quarters at Nellore, Gudur and Kavali. There are three Municipalities namely Gudur, Kavali and Venkatagiri and one Municipal Corporation- Nellore.

An Industrial Park is being proposed at Attivarami village in Ozili Mandal of Sri Potti Sriramulu Nellore District district of Andhra Pradesh. The site is located 24 Km south west of Gudur and 12 km from Naidupet in Naidupet - Venkatagiri Road with an area of 406.26 Acres. The Location is given in **Figure 2-1** and satellite image of the site is given in **Figure 2-2**. The salient features of the site are given in **Table 2-1**.

Table 2-1 Salient Features of the Site

Item	Details	
Location	Attivaram Village	
Survey No.	55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76,77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 97, 98, 99, 101, 102, 103, 104, 105,106.	
Tehsil	Ozili	
District	Sri Potti Sriramulu Nellore District	
State	Andhra Pradesh	
Site Latitude and Longitude	South East	13°55'33.53"N - 79°47'32.73"E
	North East	13°56'24.05"N - 79°47'35.09"E
	South West	13°55'35.91"N - 79°46'51.89"E
	Noth West	13°56'33.15"N - 79°46'49.15"E
Topography	Plain	
SOI Toposheet	57-013	
Above Mean Sea level in m	25 - 30 m above mean sea level	
Nearest Railway Station with distance	Naidupet -12 Km	
Nearest Airport along with distance	Chennai Air port -110 Km	
Nearest Town along with distance	Naidupet ? 12 Km	

Nearest City along with distance.	Gudur -24 Km
Nearest Highway	NH-5 ? 9 Km

2.2 SURROUNDING FEATURES

Surrounding features of the project around 10 Km radius are summarized in below **Table 2-2**.

Table 2-2 Proposed Project Surrounding Features

Sl. No	Area	Distance (Kms)
1.	Attivaram Village	116 m
2.	APIIC Multi Product SEZ	2.5
3.	Menakur Village	2.75
4.	Swarnamukhi River	6.4 Km

Figure 2-2 Topomap of the Project Site

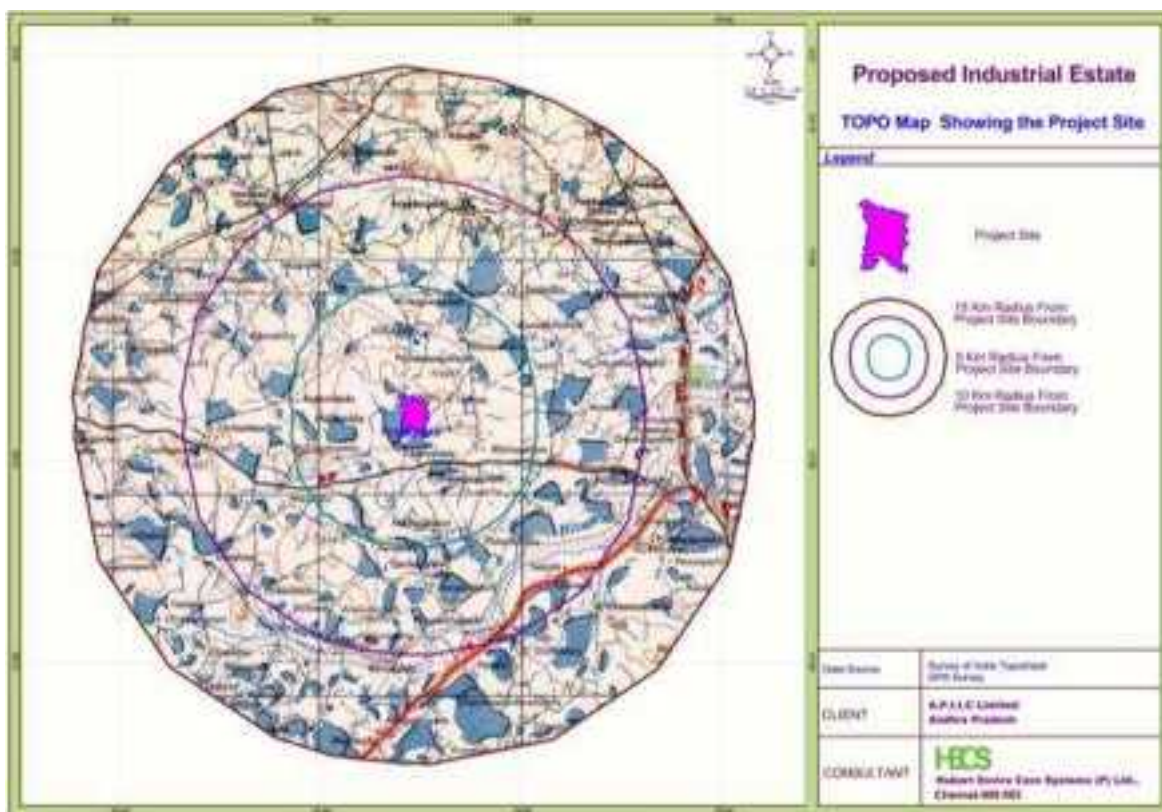


Figure 2-3 Satellite image of the Project Site

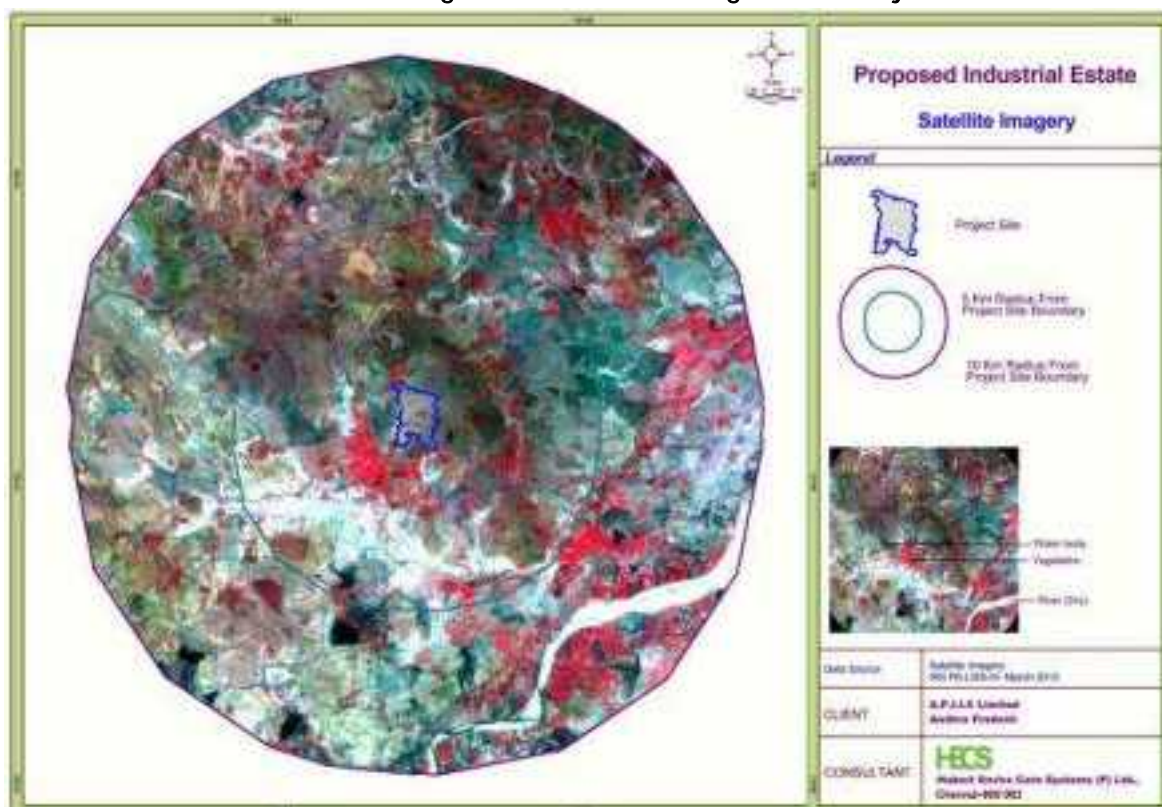


Figure 2-4 Site Photographs



Internal Roads



Pettancheruvu on the western Boundary



Mamedicheruvu on the south of site

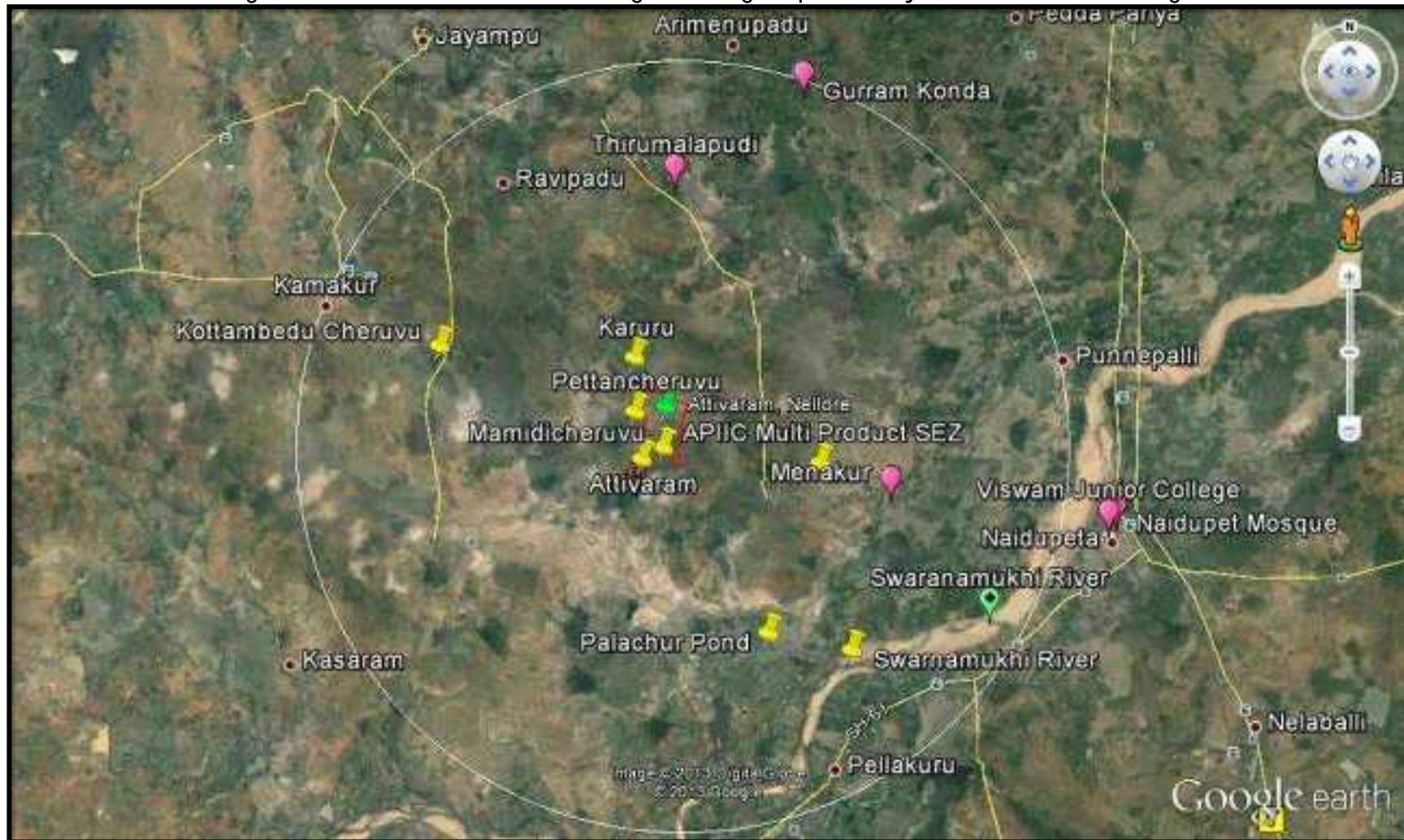


Existing unit DRA Industries Ltd



Existing Unit Nithya Steels & Alloys Pvt.Ltd.

Figure 2-5 10 Km radius Satellite Image showing Proposed Project site and Surrounding Features



2.3 SITE JUSTIFICATION

APIIC with the aim of industrial development has been developing industrial parks through-out the state. Nellore district has the port and Air port which will be an added advantage for the business & socio-economic development and improvement for the district. Good and broad road and railway network connects Nellore district to various parts of the country. Hence APIIC has proposed the plans for the Industrial park in this district.

The connectivity of the site to port, airport, railway and road is as follows:

- a. **Port Connectivity-** Presently Chennai is meeting the exporting needs of the Industrial units of Nellore district which is 105 Km from site. Ennore Port is 94 Km from the site. The site is about 50 Km away from the Krishnapatnam Port. The site is well connected to all the three ports.
- b. **Airport Connectivity-** The site is about 41 from the Tirupathi Airport and 110 Km from Chennai Airport. The site is well connected to both the airports.
- c. **Rail Connectivity-** The site is about 12Km from Naidupet Railway Station from which railway lines could be drawn in for goods carriers.
- d. **Road Connectivity-** The site is about 12 Km from NH- 5 connecting Chennai - Kolkata.

2.4 LAND FORM & LAND OWNERSHIP

The proposed area for the Industrial Estate of 406.26 Acres falling within Survey No. 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 97, 98, 99, 101, 102, 103, 104, 105, 106 has been handed over to APIIC. The Land Documents and the site extent is given in **Annexure-1**.

2.5 PROPOSED MASTER PLAN BY APIIC

The proposed area for Industrial Estate is 406.26 Acres. The Master Plan is given in **Annexure-2** and the Area breakup of Plot area is given in **Table 2-3**.

Table 2-3 Area Break up Detail for Proposed Project

Area Break Up	Area (Acres)	Percentage (%)
Bulk allotment	104.23	
Plotted Area	227.66	75.38%
Road Area	19.02	6.29%
Open space Area	30.99	10.26%
Green Belt	11.08	3.67%
Common Facilities	13.28	4.40%
Total	406.26	100%

2.5.1 Plotted Area

Total plotted area for the proposed site 227.66 acres. There are totally 64 plots proposed for the site. The industries are classified as Red, Orange and Green category. The individual plot area to be allotted for each industry is given in **Annexure-2, Master Plan**. Already allotment is made for 8 plots. Two industries namely Nithya Steels and Alloys Pvt. Ltd. and DRA Industries Ltd. are existing at site. The list of allotted industries is given in **Table 2-4**. Around 56 plots are vacant and the type of industries which could come in the vacant plots is given in **Table 2-5**. The allotments proposed for the vacant plots are based on the enquiry and the availability of raw materials in the district.

Table 2-4 List of Industries Allotted

Plot no	Name of Industry	Type of Industry	Classification as per APPCB	EIA Category as A/B with conditions to be implied in APIIC park		Total Area in Acre
4	M/S. Balaji Chirex Pvt.Ltd	Manufacturing of Drugs & Nutraceuticals	Red	A	-	4.54
5	M/S. Shimoga Life Sciences Pvt. Ltd	Manufacturing of Alkaloyds & Preparation Thereof, N.E.C	Red	A	-	4.5
6	M/S. Anvitha Life Care	Manufacturing of Herbal medicine, Active pharmaceutical ingredients, chemical Intermediates and fine chemicals	Red	A		4.48
9	M/S. DRA Industries Ltd	Alloy Steels	Red	B	-	104.23
10	M/S. BDJ Oxides Pvt. Ltd	Zinc Oxide & Allied Products mfg Unit	Red	B	-	6.0
25	M/S., Nithya Steels & Alloys Pvt Ltd	M.S.Billets/ Ingots dated 29/05/2013	Red	B		20.45
26						
30	M/S. Manjunatha Manufacturing Industries	Manufacturing of Polish, Shellac, Woodpolish/French Polish Thinner	Red	A		0.70
Total				-	-	144.9

Table 2-5 Details of Allotted Industries

S.No	Industry	Manufacturing capacity proposed	Raw materials used	Fuel Used	Water requirement	Power requirement	APC/ Effluent treatment Measures	Details of CFE/CFO
1	M/s. Balaji Cherix Pvt. Ltd.	10 to 12 MT PA	Alkaloids	Coal	7000 Litres per tonne of finished product	100 HP	Scrubbers will be provided	Yet to apply
2	M/s. Majunatha Manufacturing Industries	Thinners ? 40 MTPA Wood polish - 20 MTPA Polish Shellac - 20 MTPA	Solvents, Resins, Additives	-	200 Litres/ day	20 HP	-	Yet to apply
3	M/s.Shimoga Life Sciences Pvt Ltd.,	60 MTPA ? API, fine chemicals	Alkaloids	-	20 KL per Tonne of Finished product	200 HP	ETP to be provided	Yet to apply
4	M/s. Anvitha Life Care	60 MTPA ? API in Phase I 90 MTPA ? API in Phase II	Alkaloids	-	30 KL	200 HP	ETP to provided	Yet to apply
5	M/s. DRA Industries	93978 TPA of MS Billets and alloys	MS scrap, Iron	Electrical Furnace	60 KL	17.3 MW	Stack monitoring	Yet to apply
6	M/s. BDJ	Zinc Oxide	Rubber	Oil		880 KW	-	Yet to apply

S.No	Industry	Manufacturing capacity proposed	Raw materials used	Fuel Used	Water requirement	Power requirement	APC/ Effluent treatment Measures	Details of CFE/CFO
	Oxides Pvt.Ltd.	Indl.Grade - 14,400 MT Rubber Cloth/ Sheet - 3,000 MT	cloth / Sheet, Zinc Oxide Indl.Grade.					
7	M/s. Nithya Steels and Alloys Pvt. Ltd.	30,000 TPA-MS Billets and Ingots	MS Scrap, Pig Iron, Sponge Iron, Ferro Alloys	Electric Furnace	60KL	10.5 MW	Stack monitoring	Consent Order No. 166/ PCB/ ZO- VJA/CFO/W &A/2012-422 dated 23/5/2013

Table 2-6 Tentative List of Industries which can be proposed

S.No.	Type of Industry	Classification as per APPCB	EIA Category as A/B with conditions to be implied in APIIC park	
1	Cutting, sizing & polishing of marble stones	Orange	Not applicable	-
2	Thermocole Manufacturing	Orange	Not applicable	-
3	Paints & varnishes (Mixing & Blending)	Green	Not applicable	

4	Glass, ceramic, earthen potteries manufacturing using oil or gas fired kiln, coating on glasses using cerium fluoride, magnesium fluoride etc.	Orange	Not applicable	-
5	cutting, sizing & polishing of marble stones	Orange	Not applicable	-
6	Brick fields	Orange	Not applicable	-
7	Spray painting, paint baking, paint stripping	Orange	Not applicable	-
8	Rubber Manufacturing Industry	Red	Not applicable	-
9	Production of Bricks, Tiles, Mangalore tiles, crucible etc.,	orange	Not applicable	-
10	Polyethene Bag Manufacturing	Green	Not applicable	-
11	Cement products like pipe, pillar, jafri, well ring, blocks/ tiles	Green	Not applicable	-
12	Flexible Packaging	green	Not applicable	-
13	Fly Ash Brick Unit	Green	Not applicable	-
14	Printing ink manufacturing	Orange	Not applicable	-
15	Ceramic Color Manufacturing	Green	Not applicable	-
16	Block making for printing without foundry (excluding wooden block making)	Green	Not applicable	-

17	Insulation and coated papers manufacturing (excluding pulp & paper manufacturing)	Green	Not applicable	-
18	Assembly of air coolers/ conditioners, servicing	Green	Not applicable	-
19	Digital printing on flex, vinyl	Orange	Not applicable	-
20	Automobile servicing, repairing	Orange	Not applicable	-
21	Printing press	Green	Not applicable	
22	Tyres and tubes retreading (without boiler)	Green	Not applicable	-
23	Repairing of motors and generator	Orange	Not applicable	-
24	Plyboard manufacturing with oil fired boiler/ thermic heater (without resin plant)	Orange	Not applicable	-
25	Power press	Orange	Not applicable	-
26	Non alcoholic beverage and bottling(soft drinks)	Red	Not applicable	-
27	Automobile fuel outlet	Green	Not applicable	-
Total Vacant area available = 82.76 acres				

2.5.2 Open Area

Open area of 10.26% will be provided by APIIC which can be used for Green belt development. The open area allotted is 30.99Acres.

2.5.3 Green Belt Area

Green Belt of 3.67% will be provided by APIIC apart from open area The area allotted is 11.08Acres.

2.5.4 Road Area

Internal roads will be provided by APIIC. Total area of 19.02 Acres will be provided for internal roads. The Traffic Circulation Plan is given in **Annexure-3**.

2.5.5 Facility Area

Total area allotted for common facilities is 13.28 Acres. This includes an Administration Building is proposed in the plot and common Facilities like Bank, ATM, canteen, post office, weigh bridge, truck parking area, fire station and Occupational Health Centre is proposed to facilitate the Industries within the Estate.

It is proposed to provide weigh bridge and truck parking within an area of 7500 Sqm.

Apart from this raw water storage tank, waste processing area, electrical substation is proposed. The total area allotted for common facilities is 51250 Sqm.

Also 13000 Sqm is proposed to be allotted for small vendors.

3. RESOURCE REQUIREMENT

3.1 WATER REQUIREMENT

3.1.1 Construction Phase

Water requirement during the construction phase will be around 200 KL per day for development of Infrastructure facilities.

Approximate people working will be around 250 nos.

S.No	Activities	Water Requirement
1	Labors	15
2	Construction water	135
3	Other activities	50
Total		200

3.1.2 Operation Phase

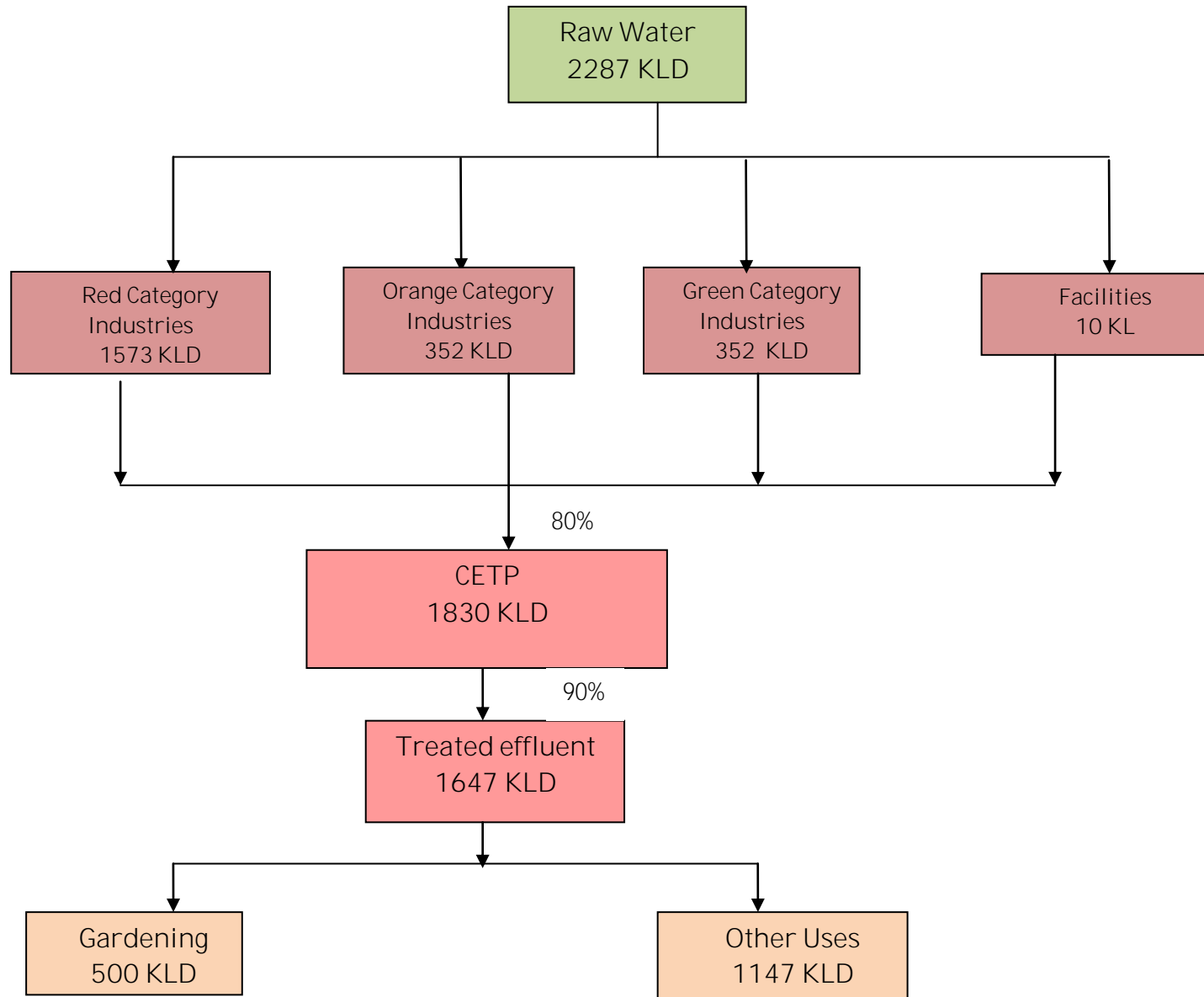
During Operation Phase, the water requirement is approximately calculated as 10 KL/ acre . The total plotted area is 227.66 Acres and common facilities area is 13.28 Acres. Hence the water requirement is calculated as approximately 2287 KLD, taking into consideration the requirement for common facilities also.

The water can be sourced from the Kandaleru Reservoir which is around 46 Km from site.

Table 3-1 Water Requirement for different Industries

S.No	Type of Industry	No. of Industries	Area in Acres	Total Water Requirement @ 10 KL/ Acre (KLD)
1	Red category	10	157.3	1573
2	Orange category	25	35.18	352
3	Green category	29	35.18	352
5	Common Facilities		13.28	10
Total		64		2287

Figure 3-1 Water Balance



3.2 POWER AND FUEL REQUIREMENT

The overall power requirement for the proposed project is approximately, 46.6 MW and the source of power is APCPDCL.

Table 3-2 Power Requirement Breakup

S.No.	Type of Industry	No. of Industries	Power Requirement	Total Power Requirement
1	Engineering & Fabrication	3	800 KW	4000 KW
2	Drugs & pharmaceuticals/chemicals	3	350 KW	1200 KW
3	Heavy industry	2	1500 KW	3000 KW
3	Packaging/processing	25	300 KW	7500 KW
4	Brick/ Tile/ marble/press	20	200 kVA	4000 KW
5	Others	11	250 KW	2750 KW
6	Admin & CFC		300 KW	300 KW
7	Street lighting		50 KW	50 KW
				22800 KW = 22.8 MW

A 132 KV substation is available at Menakur which is 1 Km from the proposed site.

3.3 MANPOWER REQUIREMENT

The proposed project required about 250 personnel during construction phase and 3000 personnel during operation phase.

3.4 MATERIALS REQUIREMENT

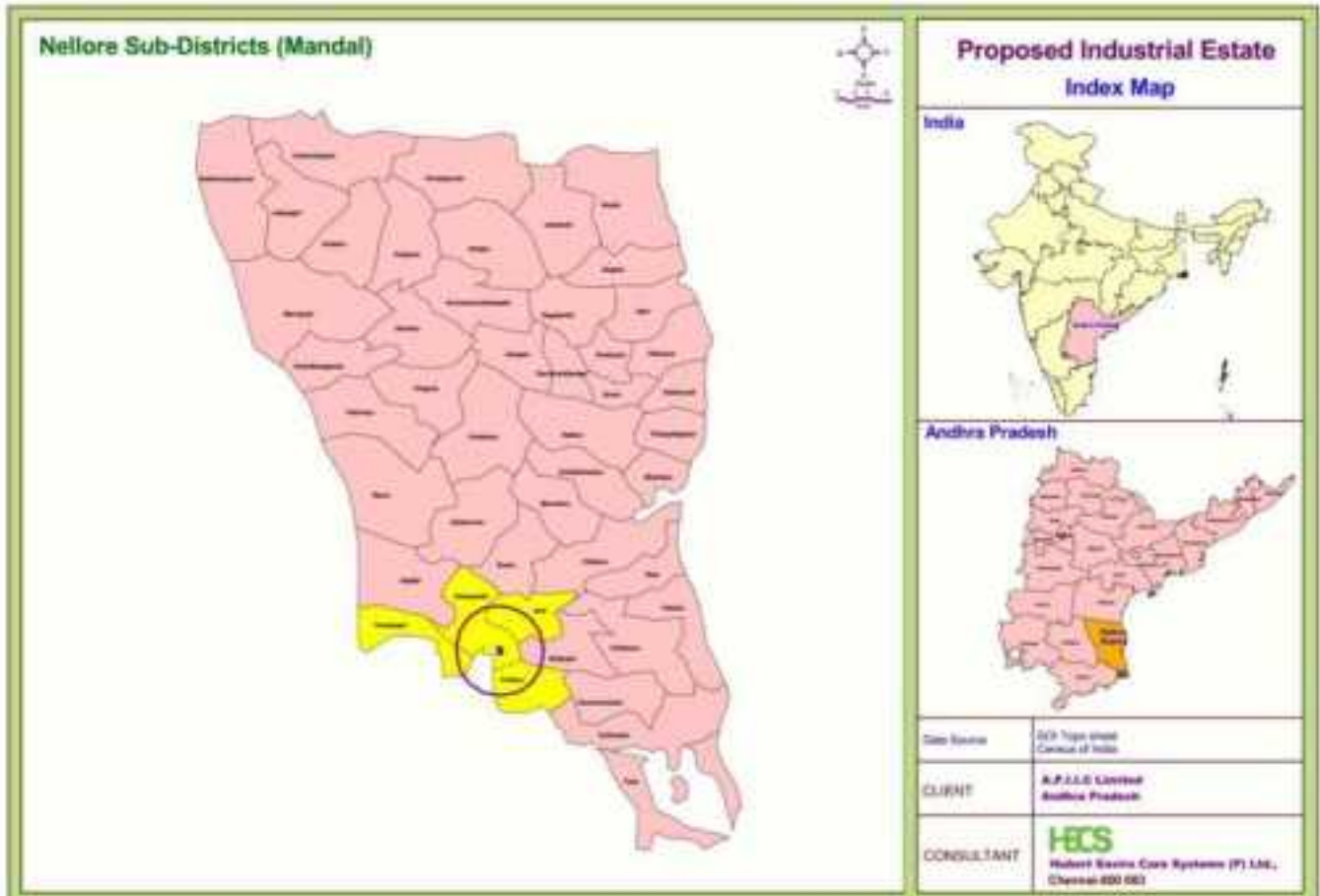
All construction materials will be procured locally from 50 km radial area.

4. EXISTING ENVIRONMENTAL SETTINGS

4.1 LOCATION

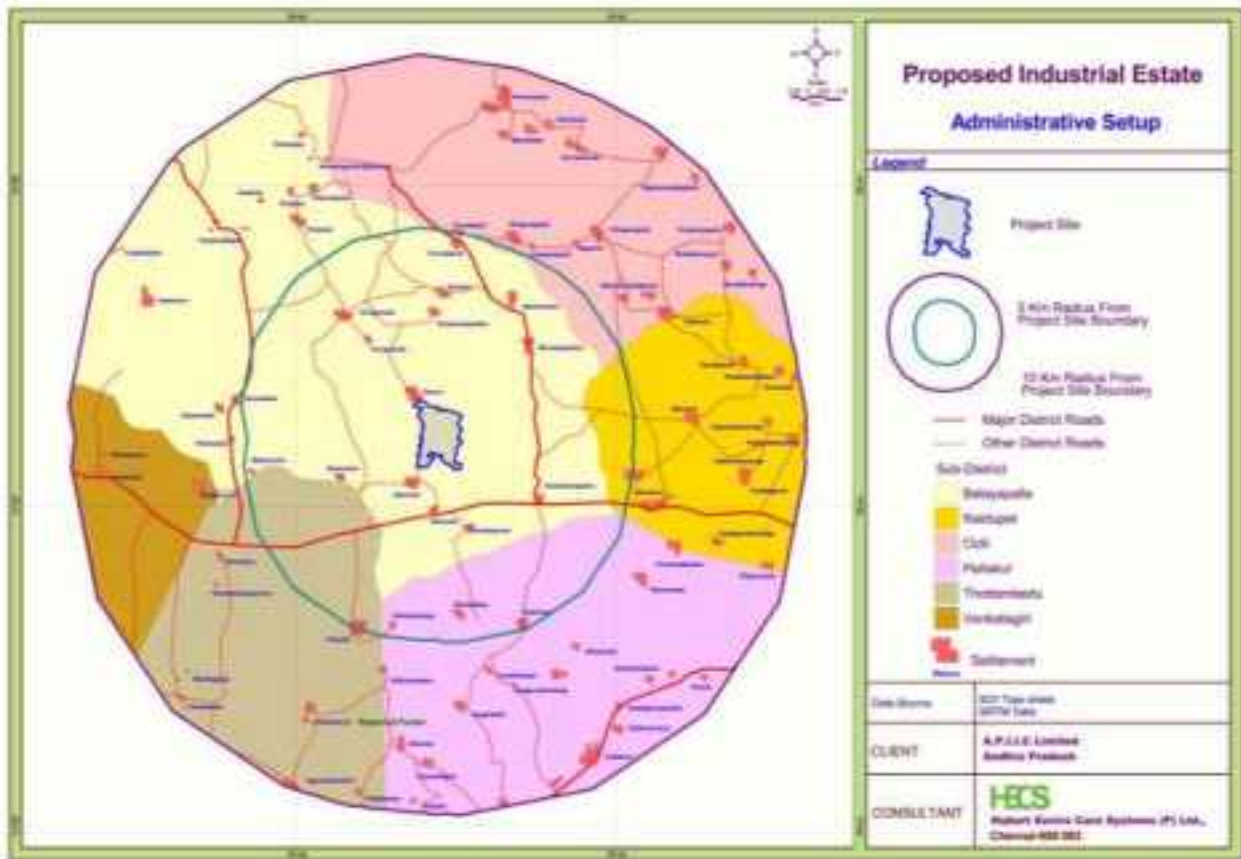
The proposed Industrial estate is located in Nellore District. The site is located 24 Km south west of Gudur and 12 km from Naidupet in Naidupet ? Venkatagiri Road. The total area of the proposed site is 406.26 acres.

Figure 4-1 Site Location



The Administrative unit within 10 km radius zone comprises of parts of Balayapalle, Naidupet, Ozili, Pellakur, Thottambedu and Venkatagiri mandals of Andhrapradesh Districts. The study area (10 km radius from the project boundary) lies between N. Latitudes 13.80° and 14.02° and E Longitude 79.43° and 78.83° and forms part of the Survey of India Toposheet Nos. 57-O13,09, 57-N12 & 16, The project site is well connected by Railway and highway. Besides these, there is a good network of motor able roads in the study area.

Figure 4-2 Administrative setup of Site and surroundings



4.2 CLIMATE

April and May are the hottest months and the hot winds generally last till the end of June. The hottest day falls in May with some shift to June. The coolest day falls between the months of December and February. During southwest Monsoon winds are from west and North West. This region depends mainly on the North East monsoon. The North East monsoon occurs along the East Coast of India during the month of October and continues till December. This period gives about 60% annual rainfall.

4.3 RAINFALL

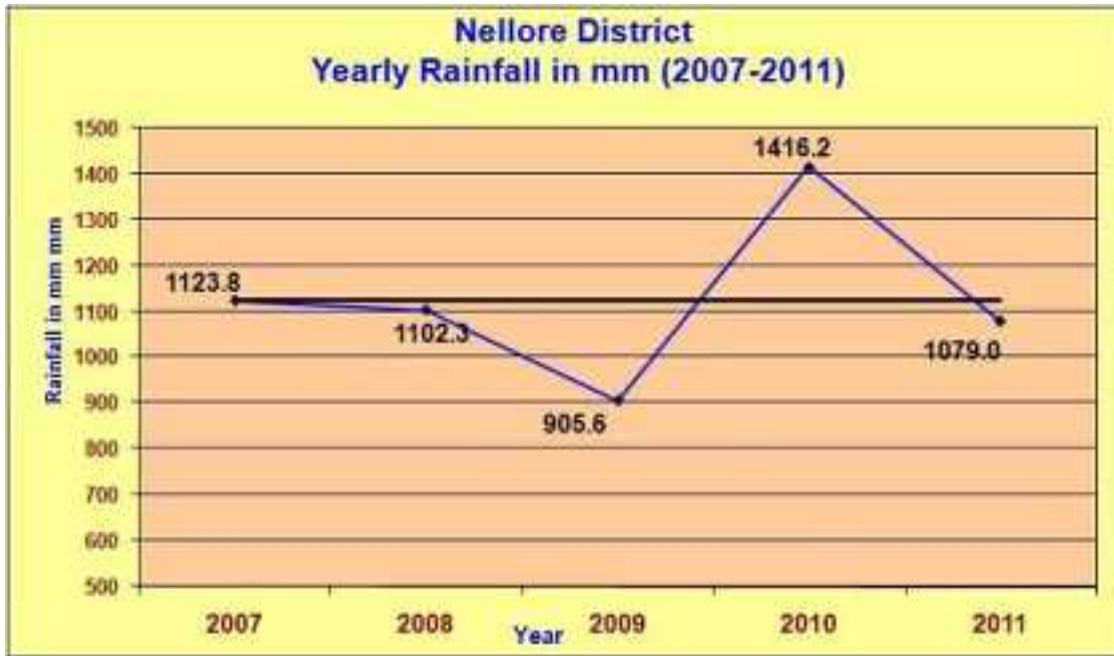
The 5 years monthly rainfall for the Nellore district has been collected from the Indian Meteorological Department (IMD). The normal annual rainfall in the district is around 1125.38 mm. The study area receives fairly good amount of

rainfall during North east monsoon. The monthly and yearly rainfall for the Nellore district is as shown in **Figure 4-3 and 4-4**. Around 75 % of the rainfall occurs during North east monsoon and the remaining rainfall occurs during South west and Transitional period. The probability of occurrence of normal rainfall over the study area has been studied. It is observed that the chances of receiving normal annual rainfall are in the range of 30 to 40 % over the entire study area.

Figure 4-3 Five Years Monthly Rainfall of District



Figure 4-4 Yearly Rainfall Pattern of Nellore District



4.4 PHYSIOGRAPHY

The general elevation of the study area ranges from 25 m to 136 m above MSL. The elevation contour indicates the area is sloping towards East. Relatively higher elevation is observed in the north western side of the project site. Isolated hill of relatively higher altitude are noticed in the study area of 10km radius. The project site is located at 25 - 30m amsl. The physiography of the study area is presented in Figure 4-5.

Figure 4-5 Physiography of the Study Area

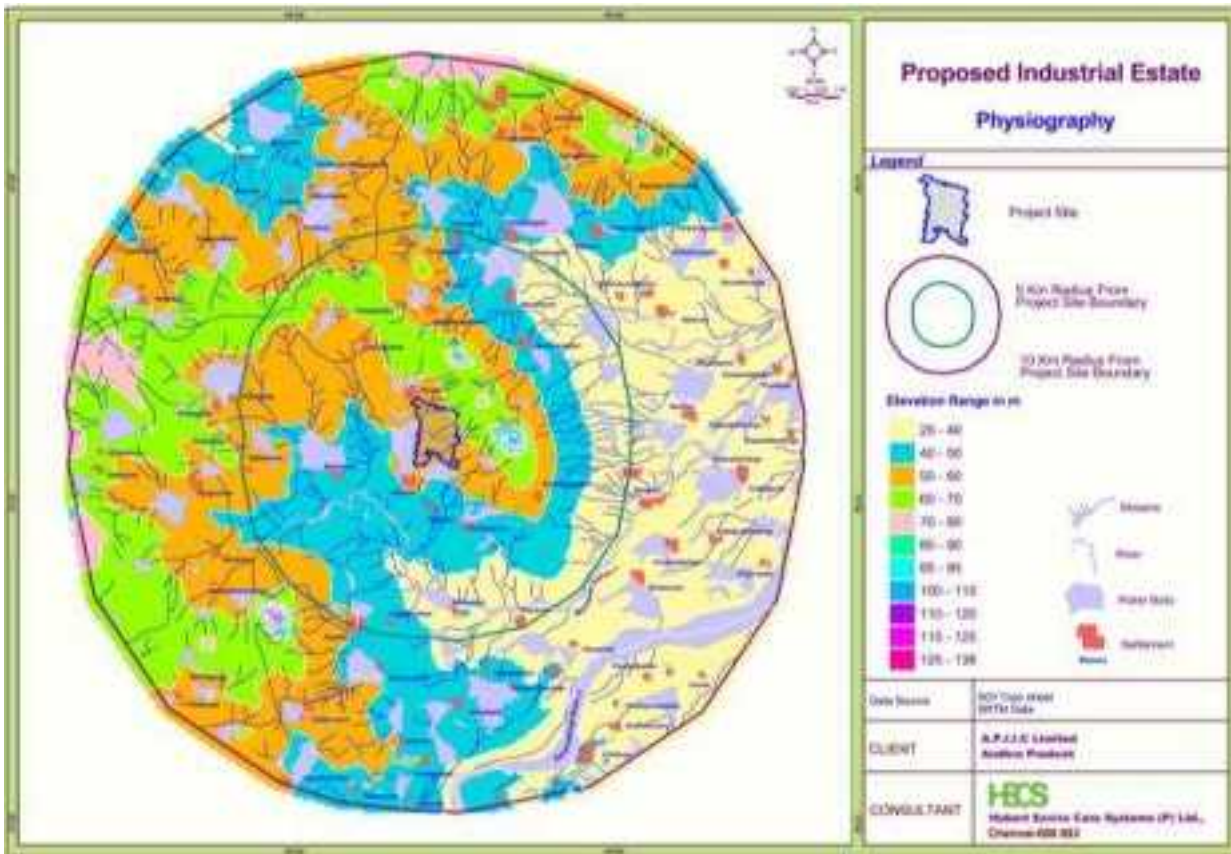
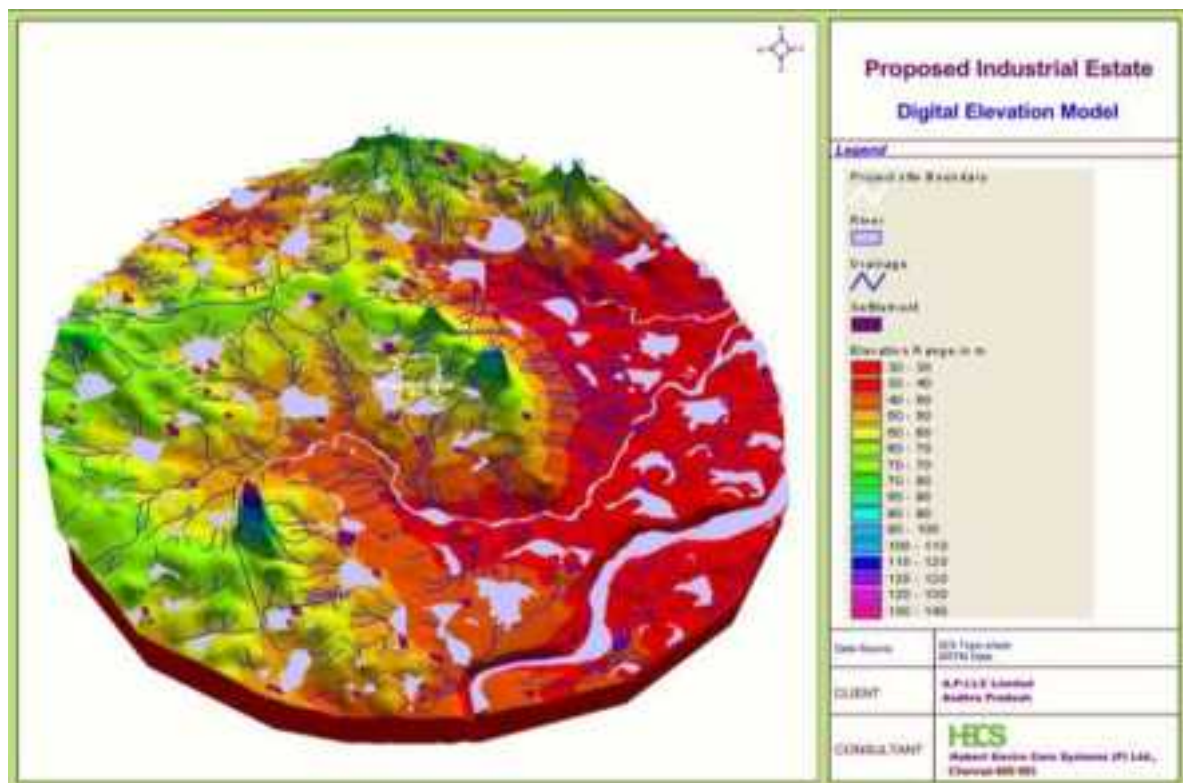


Figure 4-6 Digital Elevation Model of the Study area

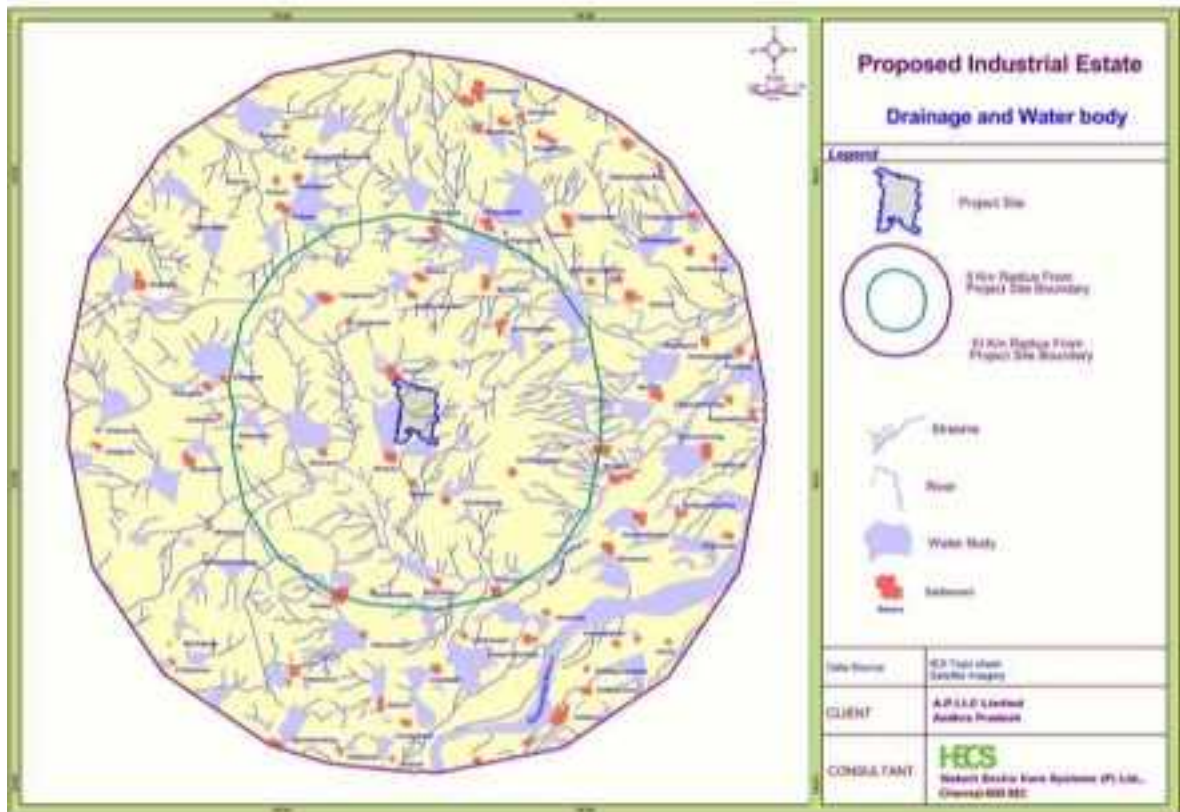


4.5 DRAINAGE AND WATER BODIES

Surface water plays major role in irrigation when compared to the ground water source. The project site is located among number of streams. River Swarnamukni is in the NE/SW of the project area about 5 km from the project area. The river is wide and ephemeral in nature Mamandi kalva river is also in the south of the area and large number of irrigation tanks are also exists in the surrounding area.

The drainage of the study area is mostly controlled by the structural features. Streams flowing in the low lying tracts have been bounded on one side and serve as storage tanks for collection of rain water. The rivers, Streams and Tanks are forming part of the major recharge system. The drainage map of study area is given in **Figure 4-7**.

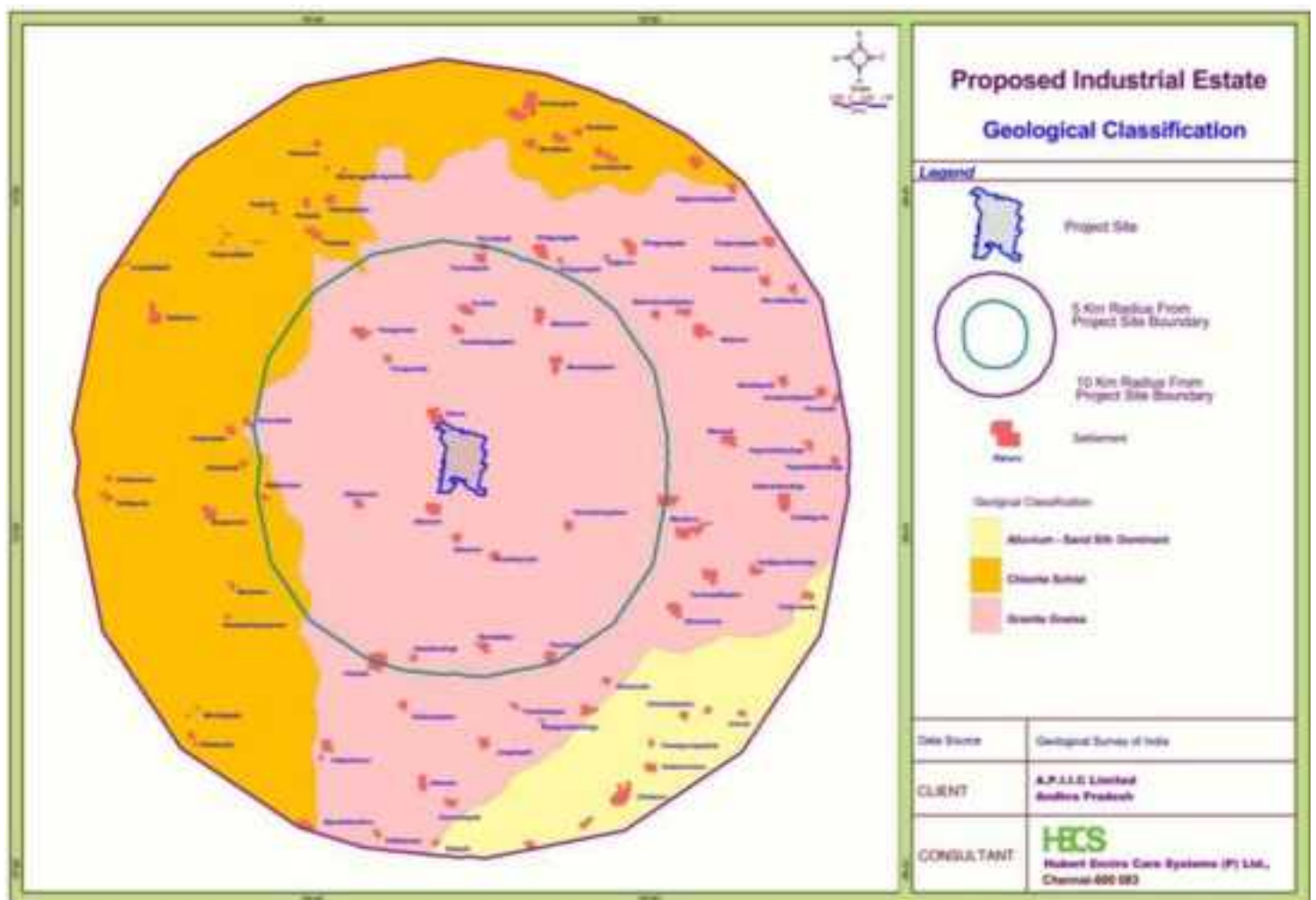
Figure 4-7 Drainage Map of Study area



4.6 GEOLOGY

The area is underlain by Dharwar Super Group. Peninsular Gneissic Complex and Older Metamorphic of Archaean Age consisting of granite gneisses, schists intruded by basic dykes and pegmatite reefs. Laterite cappings of Sub-Recent Age are seen over the crystallines in places. The alluvium of fluvial origin comprises sand, silt and clay in various proportions occur along the banks of Swarnamukhi river. The study area (10 km radius) comprises of the following rock types. Granite gneiss, Chlorite Schist and Alluvium sand silt dominant. The project site shale is located in Granite schist. The litho profile indicates that about 1.5 to 2.0 m red and black clay top layer is followed by kankar and the country rock.

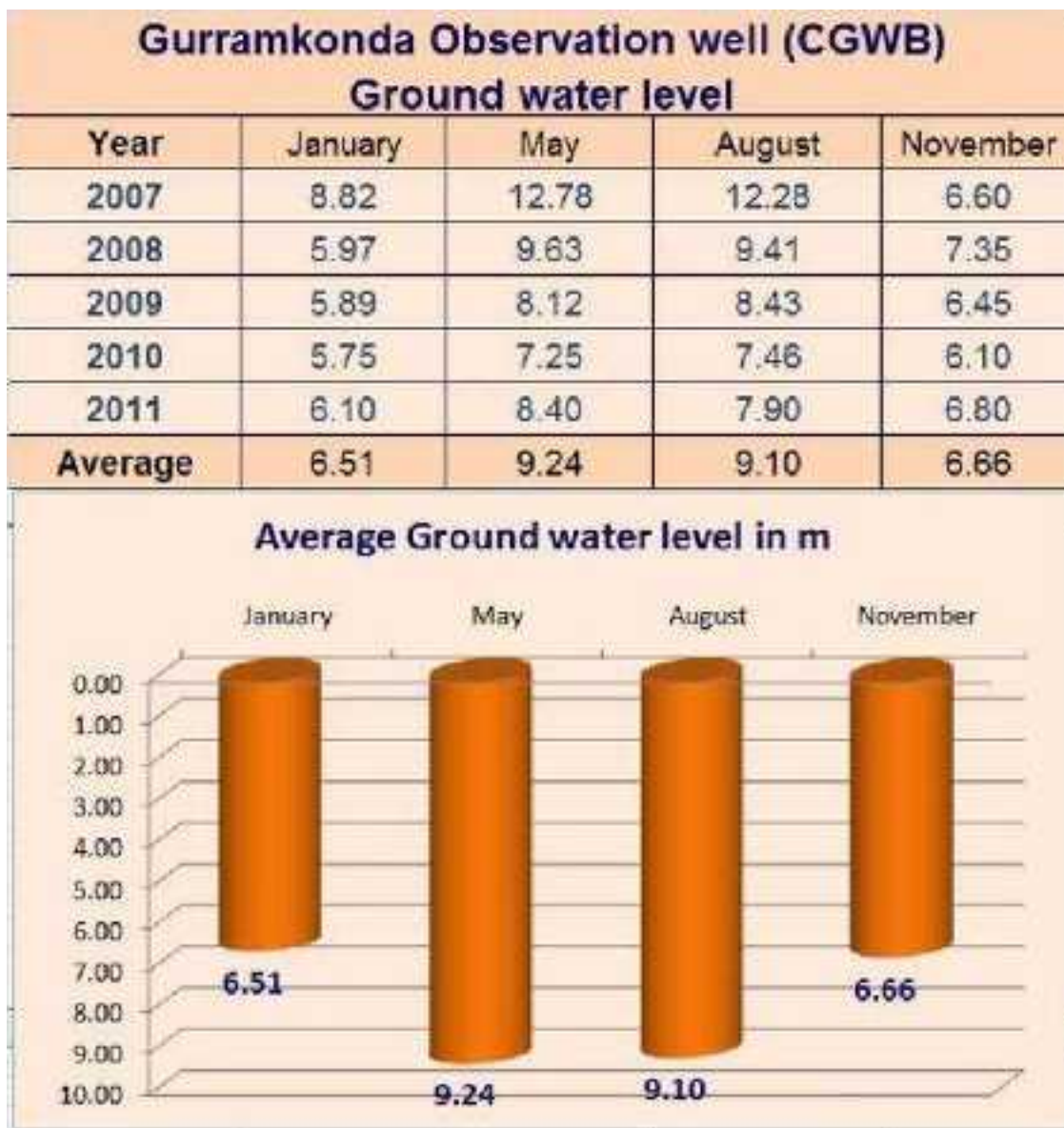
Figure 4-8 Geological Classification of the Study Area



4.7 GROUND WATER

Ground water level data for a monitoring well collected from CGWB located in Gurrankonda indicates that the deepest water level is 12.78 m bgl during May 2007 and shallowest water level is 5.75 m bgl January 2010. The season wise ground water level data collected for Gurrankonda monitoring well is given below. It clearly indicates that the natural recharge is good in and around the project site. The Ground water levels for five years are given in Figure 4-9.

Figure 4-9 Ground water Levels at Project Site



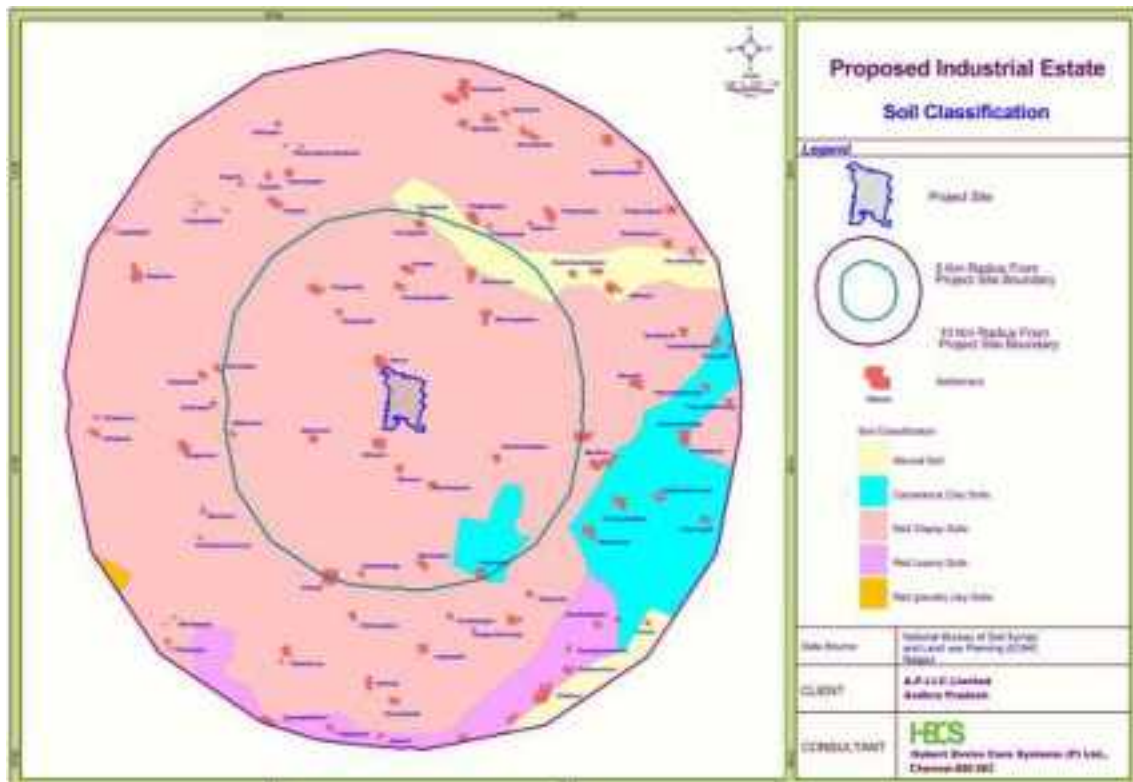
4.8 SOIL TYPE

Soil type and its fertility of an area are essential to plan for cropping. Soils are primarily derived from parent rocks. The colour, texture and mineral content are normally used to classify the soils. The soil in the study area is classified into 5 types. They are as follows. The soil map of the study area is prepared based on the National Bureau of Soil Survey and Land use Planning, Nagpur is presented in **Figure 4-10**. **Table 4-1** presents the soil classification of study area. Red clayey soils occupies 75 % of the study area. Project site lies in the same soil.

Table 4-1 Soil Classification of the Study Area

S.No	Soil Type
1	Alluvial Soil
2	Calcareous Clay soil
3	Red Clayey soil
4	Red loamy soil
5	Red gravelly clay soil

Figure 4-10 Soil Classification of the Study Area



4.9 LAND USE

For the preparation of land use map IRS P6 LISS-III Satellite data was procured from NRSC, Hyderabad. At most care has been taken to select the cloud free satellite data. The recent data dated March-2010 digital has been taken for the preparation of land use mapping. Visual interpretation technique has been adopted for land use classification based on the interpretation keys suggested in the guidelines of NNRMS, Bangalore.

The land use of the study area reflects the socio-economic conditions of the people in addition to the natural environmental factors. The factors controlling the land use pattern of the area are land forms, slope, shape of the land, soil, natural resources and natural and manmade hazards. In the hills of the study area there is no dense vegetation. Vegetation consists of thorny bushes and shrubs. The uncultivable area includes barren and non-cultivable waste. The land use pattern of the study area is given in Figure 4-11.

Figure 4-11 Land use Pattern of the Study Area

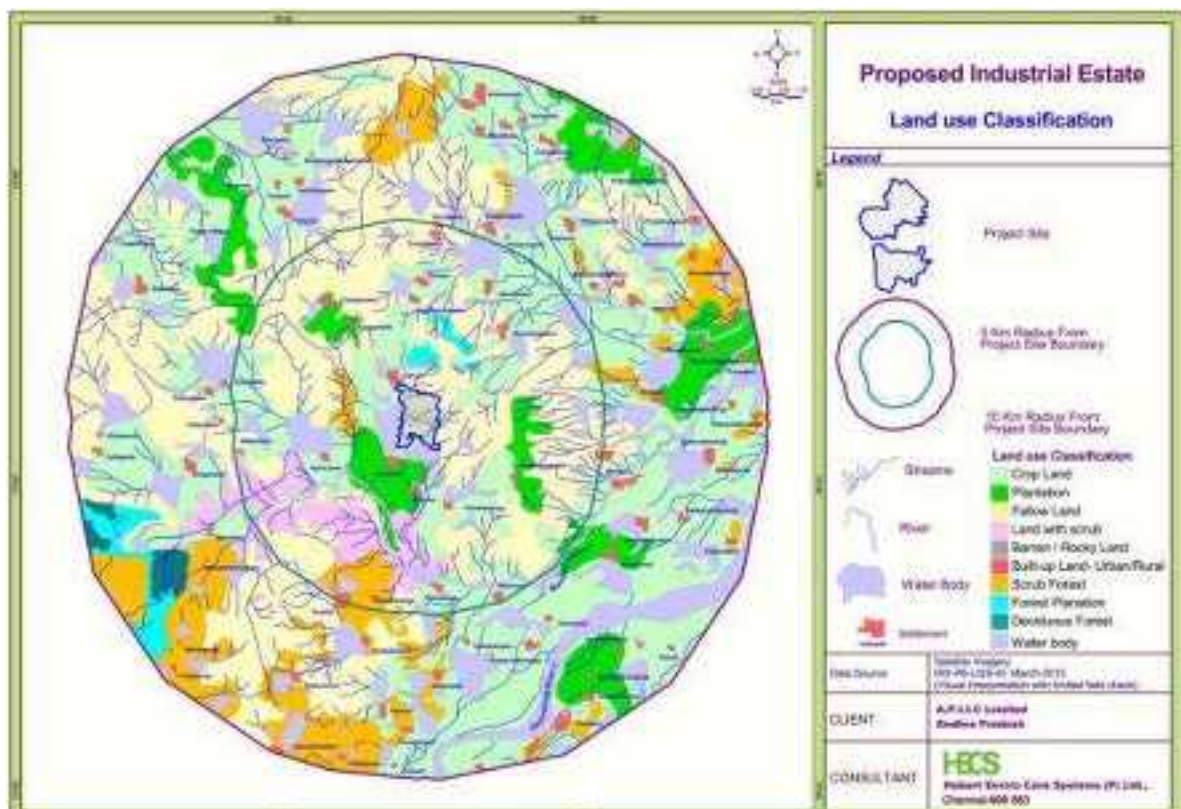
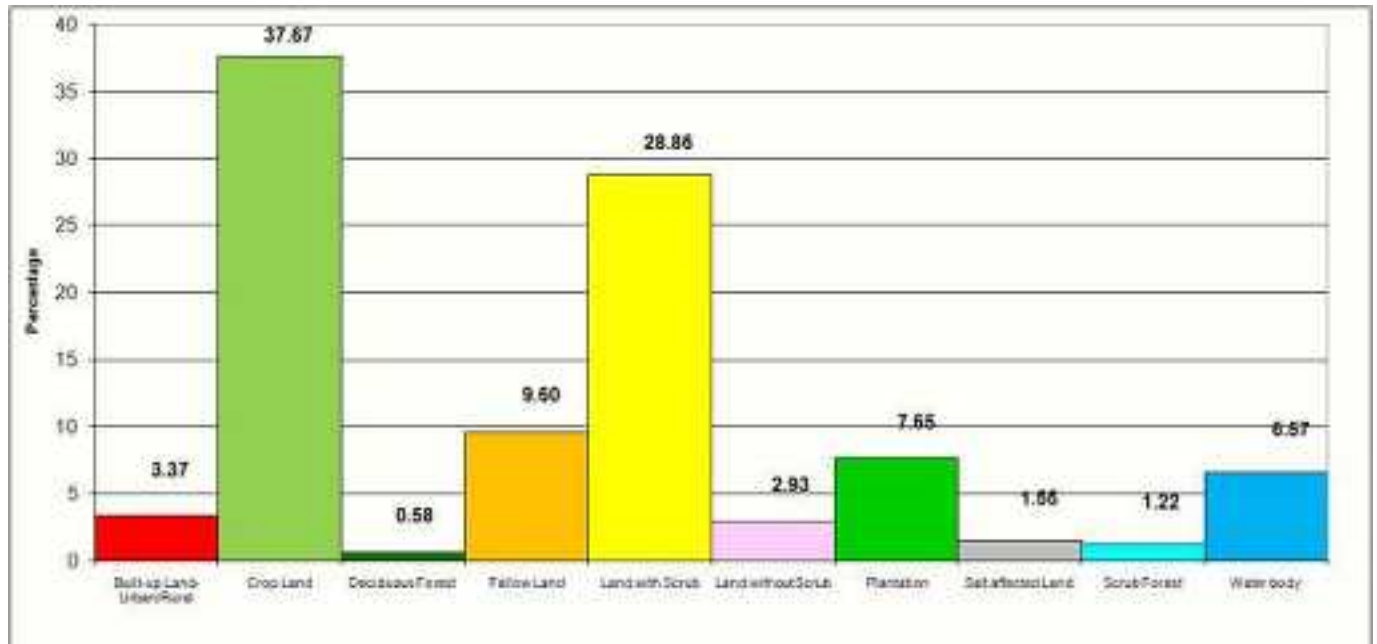


Table 4-2 Land use Classification

Land Use	Area in %
Built-up Land- Urban/Rural	3.37
Crop Land	37.67
Deciduous Forest	0.58
Fallow Land	9.60
Land with Scrub	28.86
Land without Scrub	2.93
Plantation	7.65
Salt affected Land	1.55
Scrub Forest	1.22
Water body	6.57
Total	100

The crop land occupies 37.67 percentage of the study area followed by Land with scrub (28.86 %). Fallow land occupies 9.6 %. Plantation occupies 7.65 %.



4.10 CROPPING PATTERN

The cropping pattern of Kharif and Rabi is practiced. The following table shows the crops that are cultivated in Nellore District. Both the cropping pattern are followed.

Table 4-3 Cropping Pattern

Major Crops cultivated	Area (000 ha)				Total
	Kharif		Rabi		
	Irrigated	Rainfed	Irrigated	Rainfed	
Paddy	64.6	-	191.5	-	256.1
Blackgram	0.3	-	-	20.5	20.8
Sugarcane	7.8	-	6.3	-	14.1
Groundnut	7.1	-	5.5	-	12.6
Bengalgram	-	-	-	10.5	10.5
Sunflower	3.8	-	-	5.2	9.05
Tobacco	6.1	-	0.8	-	7.0
Cotton	5.6	-	0.8	-	6.4
Seasme	1.6	-	-	0.6	2.2
Greengram	0.08	-	-	2.08	2.1
Chilli	0.049	-	1.5	-	1.6
Redgram	0.7	-	-	0.3	1.04
Maize	-	-	-	-	-

Source : APHU (2008-09)

4.11 IRRIGATION SOURCES

The major sources of irrigation are canals, tanks, open wells, bore wells and lift irrigation schemes. The table below shows the total irrigated area of the district.

Table 4-4 Irrigation Sources of the District

S.No	Sources of irrigation	Number	Area (000 ha)	Percentage of total irrigated area
1	Canals	332	87.7	35.9
2	Tanks	1763	73.8	30.2
3	Open wells	31,479	14.9	5
4	Bore wells	47,898	73.8	30.2
5	Lift irrigation schemes	3,212	11.1	-
6	Other Sources		11.1	3
	Total Irrigated area	326.4		

4.12 INDUSTRIES

The District has 38 Large and Medium Industries in the sectors such as Sugar cane crushing, Prawn Processing, Shrimp feed, Drugs, Pharmaceuticals, Dry Batteries, Carbon Electrodes, Beverages, Textiles, Dairy Units, Aluminum Cans, Rubber, Mould Caps, Iron Castings etc.

4.13 SOCIO ECONOMIC ENVIRONMENT

The Population of the District as per 2011 census and the percent growth is given in Table 4-5. The variation in population of 2001 and 2011 census is given in Figure 4-12.

Table 4-5 Population of the District

Nellore	2011 Census		
	Persons	Male	Female
Total	2966082	1493254	1472828
Urban	862309	433924	428385
Rural	2103773	1059330	1044443

Figure 4-12 Variation in Population between 2001 and 2011

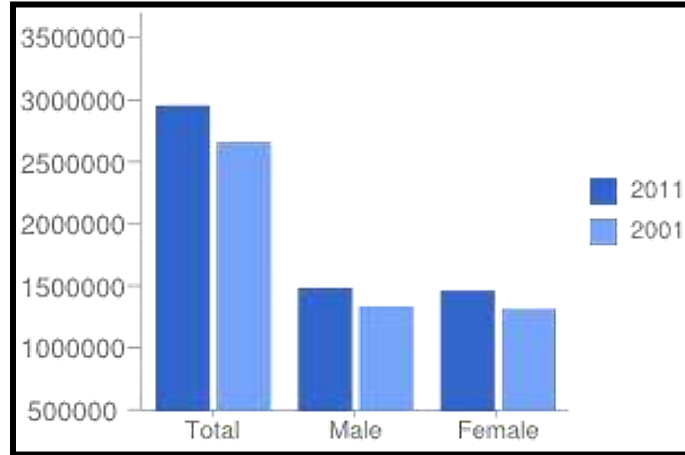


Table 4-6 Percentage Decadal Growth 2001-2011

Nellore	2011 Census		
	Persons	Male	Female
Total	11.15	11.03	11.27
Urban	43.95	43.86	44.04
Rural	1.66	1.54	1.78

List of Educational Facilities in Nellore Districts is given in Table 4-7

Table 4-7 List of Educational Facilities in Nellore District

	Primary School	Upper Primary School	High Schools	Higher Secondary Schools	Oriental Schools	Junior Colleges
Nellore District	3009	652	560	10	2	175

List of Medical Facilities in Nellore District is given in Table 4-8

Table 4-8 Medical Facilities in Nellore District

	No. of Sub Centres	No. of PHC	No. of CHC (30 Beds)	CHC (50 Beds)	Area Hospitals	District Hospitals
Nellore	477	58	11	1	3	2

5. ENVIRONMENTAL MANAGEMENT PLAN

5.1 INTRODUCTION

Environmental Management Plan (EMP) is aimed at mitigating the possible adverse impact of a project and ensuring the existing environmental quality. The EMP converse all aspects of planning, construction and operation of the project relevant to environment. It is essential to implement the EMP right from the planning stage continuing throughout the construction and operation stage. Therefore the main purpose of the Environmental Management Plan (EMP) is to identify the project specific activities that would have to be considered for the significant adverse impacts and the mitigation measure required.

5.2 CONSTRUCTION PHASE

The environmental impact during the construction phase will be of short term and reversible nature and will gradually eliminate after the construction activity is over. Further the area of the unit is small in size. Still the following measures will be considered on priority basis to minimize the impacts.

5.2.1 Modification of Drainage Pattern

- Rainwater harvesting prevents the flooding of low-lying areas in the project premises.
- A basic surface drainage system will be provided for the site to avoid water runoff on to the surrounding properties and roads, especially during the monsoon months.
- If during excavation, water accumulates in the excavated areas, then it will be pumped out and disposed off into recharge soak pits of dry bore wells.

5.2.2 Materials Transportation

- All fine earth materials will be covered during transportation to the site to prevent spillage and dusting.
- The cleanup of spilled earth and construction material on the main roads will be the responsibility of the contractor and should be done in a timely

manner (say within 4 hours) so as not to inconvenience or endanger other road users. These requirements will be included as clauses within contracts made with relevant sub-contractors.

- The transportation of lubricants and fuel to the site will only be done in the appropriate vehicles and containers, i.e. fuel tankers and sealed drums.
- As far as possible, transport of construction materials will be scheduled for off-peak traffic hours. This will reduce the risk of traffic congestion and of road accidents on the access roads to the site.

5.2.3 Materials Storage

- The stockpiling of construction materials will be properly managed and controlled. Fine grained materials (sand, marl, etc.) will be stockpiled away from surface drainage channels and features.
- Low beams will be placed around the piles and/or tarpaulin used to cover open piles of stored materials to prevent them from being washed away during rainfall.
- Safe storage areas will be identified and retaining structures constructed prior to the arrival of material.

5.2.4 Air Environment

- **Site clearance, excavation and earthmoving** -The working area for the uprooting of shrubs or vegetation or for the removal of boulders or temporary or permanent structures shall be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.
- **Access road** -Every main haul road shall be paved with concrete, bituminous materials, hardcore or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet.

- **Construction equipments**
 - a. All machineries to be used for construction purpose will be of highest standard of reputed make and company will emphasize compliance of noise pollution control norms by these equipments.
 - b. Transport vehicles and construction equipments / machineries will be properly maintained to reduce air emissions.
 - c. Equipments will be periodically checked for pollutant emissions against stipulated norms.
 - d. Exhaust vent of DG set will be kept at proper height to ensure quick dispersal of gaseous emissions.
- **Excavation and earth moving** - The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.
- **Stock Piles**
 - a. All loose material either stocked or transported will be provided with suitable covering such as tarpaulin, etc.
 - b. Water sprinkling will be done at the location where dust generation is anticipated.
 - c. Over Burden (OB) waste dumps will be sprayed with water as they are major sources of air borne particulate matter/dust.
 - d. OB waste dumps will be reclaimed / afforested to bind the loose soil and to prevent soil erosion.
- **DG Set**
 - a. D.G. set will be placed in an acoustic enclosure.
 - b. D.G. set will be placed on the wooden platform to minimize the vibration.
 - c. The green belt development will also help in reducing noise levels in the campus.

- d. Any generator to be installed at the site will meet the guidelines as laid down by Central Pollution Control Board.

5.2.5 Noise Environment

- Construction activities that will generate disturbing sounds should be restricted to normal working hours.
- Workers operating equipment that generates noise should be equipped with noise protection gear. Workers operating equipment generating noise levels greater than 80 dBA continuously for 8 hours or more should use earmuffs. Workers experiencing prolonged noise levels of 70 ? 80 dBA should wear earplugs.
- The construction activities will be restricted to the daytime and no construction will be practiced during night.
- Barricades will be provided around the construction site to confine noise within the site.
- To reduce the impact of air and noise pollution and to provide a clean, healthy environment, it has been proposed to create and maintain a green belt within the site and along the roadsides.

5.2.6 Water Environment

- Excavation will be avoided during monsoon season
- Check dams will be provided to prevent construction runoff from the site to the surrounding water bodies.
- Pit latrines and community toilets with temporary soak pits and septic tanks will be constructed on the site during construction phase to prevent wastewater from entering the ground water or surrounding water bodies.
- To prevent surface and ground water contamination by oil/grease, leak proof containers shall be used for storage and transportation of oil/grease.

5.2.7 Biological Environment

- The dust emissions will be suppressed by spraying water and then the activities will be carried out.

- Emissions from D.G sets and vehicles will be minimized by proper maintenance and by avoiding use of adulterant fuels and will be maintained below the standard limits prescribed by competent authority.
- Important species of trees will be identified and marked and will be merged with landscape plan.

5.2.8 Construction Waste Disposal

- The contractor should prepare a site waste management plan prior to commencement of construction work. This should include the designation of appropriate waste storage areas, collection and removal schedule, identification of approved disposal site, and a system for supervision and monitoring. Preparation and implementation of the plan must be made the responsibility of the building contractor with the system being monitored independently.
- Special attention will be given to minimizing and reducing the quantities of solid waste produced during site preparation and construction. To reduce organic waste, softer vegetation may be composted onsite and used for soil amendment during landscaping.
- Most of the construction materials like soil, bricks, concrete will be reused in the backfilling, road construction, sub-grade reparation etc. works. Metals, wood scraps & bitumen junks will be recycled either within site or outside with help of the local authority. The measures like reusing materials on-site and /or donating /selling salvaged items reduces waste, virgin material use and disposal cost.
- Vegetation and combustible waste will not be burnt on the site.
- Reusable inorganic waste (e.g. excavated sand) will be stockpiled away from drainage features and used for in filling where necessary.
- Unusable construction waste, such as damaged pipes, formwork and other construction material, will be disposed of at an approved dumpsite.

5.2.9 Land Environment

- The soil will be collected separately and preserved in stacks with side slopes not exceeding 1:5. The topsoil (soil on the top 15 cm patch) will be preserved separately in a stack covered by tarpaulin. Efforts will be made to reinstate the soil for backfilling purposes. Topsoil will be reused for horticultural areas.
- The spillage of oil from the machinery or cement residue from concrete mixer plants might contaminate the soil if not properly collected and disposed off. Thus most stringent safety and construction management norm will be implemented at site.

5.2.10 Health & Safety Measures

- Construction related activities will be confined only to project site area, hence no health related impact are envisaged within the project influenced area during the construction stage and will be limited to occupant levels.
- Proper drinking water, sanitation and first aid facility will be provided at the construction site, with trained shift supervisors, which will ensure minimum adverse occupational health impacts on the construction worker.
- In individual industries, safety officers will identify the hazardous and unsafe acts of workers and advise on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of Safety Rules/ Statutory Provisions.

5.3 OPERATION PHASE

Since the proposed development is an Industrial Park, only common facilities like Roads, Storm water drains, Rainwater harvesting pits, water supply line, Municipal Solid Waste processing area are proposed. Individual Industries upon establishment, will provide additional facilities as and when during the establishment by the Industries and apply for separate EC/ CFE as applicable.

5.3.1 Air Environment

- Proper stack height as per CPCB guidelines will be provided for DGs.

5.3.2 Water Environment

Water pollution from process can be divided into process and domestic wastewater.

Since Both A and B category industries are proposed a Common Effluent Treatment Plant will be proposed for treating both sewage and Effluent generated from the industries.

The treated effluent can be used for green belt development and also for use in process to reduce the fresh water consumption.

An area of 2000 Sq.m is proposed for waste management.

5.3.3 Solid and Hazardous Wastes

- During construction phase, solid waste, scrap will be generated and will be suitably disposed off.
- During operation phase, Municipal Solid waste of 1150 Kg/ day is proposed to be developed
- Area proposed for waste management is 2000 Sq.m of which around 500 Sq.m will be allotted for MSW processing.

Waste	Quantity (kg/day)	Collection method	Disposal method
Organic	520	Bins	composting
Inorganic	630	Bins	Authorized vendors

- Apart from these individual Industries will be insisted to dispose their hazardous waste generated to the common TSDF facility at Dundigal Village, Outbullapur Mandal, Ranga Reddy District which is located approximately at 430 Km from site.

5.3.4 Rainwater Harvesting System

Rainwater harvesting structures are proposed for the proposed project for utilization and to recharge the water resources in the region. Rain water harvesting structures are proposed to recharge the groundwater resources in the region. The

run-off water from the roof of the structures and paved areas will be collected through storm water drainage system and led to rain water harvesting structures. Apart from this individual industries, upon establishment will be insisted to have their own rainwater storage and harvesting facility.

5.4 OCCUPATIONAL HEALTH AND SAFETY

The individual Industries upon establishment will have their own safety measures. The problem of occupational health, in the operation and maintenance phase is primarily due to noise, which could affect hearing. The necessary personal protective equipments will be given to all the workers. The working personnel shall be given the following appropriate personnel protective equipments.

- Industrial Safety Helmet;
- Safety Helmets;
- Face shield with replacement acrylic vision;
- Zero power plain goggles with cut type filters on both ends;
- Goggles;
- Welders equipment for eye and face protection;
- Cylindrical type earplug;
- Ear muffs;
- Electrically tested electrical resistance hand gloves; and
- Industrial safety shoes with steel toe.

5.4.1 Safety Plan

Keeping in view the safety requirement during construction, operation and maintenance phases, the individual industries will formulate safety policy with the following regulations:

- To allocate sufficient resources to maintain safe and healthy conditions of work;
- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment;

- To ensure that adequate safety instructions are given to all employees;
- To provide wherever necessary protective equipment, safety appliances and clothing and to ensure their proper use;
- To inform employees about materials, equipment or processes used in their work which are known to be potentially hazardous to health or safety;
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and upto date knowledge;
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work;
- To provide appropriate instruction, training, retraining and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters;
- To ensure proper implementation of fire prevention methods and an appropriate fire fighting service together with training facilities for personnel involved in this service;
- To organize collection, analysis and presentation of data on accident, sickness and incident involving people injury or injury to health with a view to taking corrective, remedial and preventive action;
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees;
- To publish/notify regulations, instructions and notices in the common language of employees;
- To prepare separate safety rules for each type of occupation/processes involved in a plant; and
- To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipments, work places and operations.

5.4.2 Fire Safety

Some precautions and remedial measures proposed to be adopted by individual industries to prevent fire are:

- Compartmentation of cable galleries, use of proper sealing techniques of cable passages and crevices in all directions would help in localizing and identifying the area of occurrence of fire as well as ensure effective automatic and manual fire fighting operations;
- Spread of fire in horizontal direction would be checked by providing fire stops for cable shafts;
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms are effective protection methods for conveyor galleries;
- Housekeeping of high standard helps in eliminating the causes of fire and regular fire watching system strengthens fire prevention and fire fighting; and
- Proper fire watching by all concerned would be ensured.

5.5 PROJECT COST

The detailed cost break up is given in Table 5-1.

Table 5-1 Project Cost

S.No	Activities	Proposed Expenditure (Lakhs)
1	Survey	5
2	Greenery & fencing	10
3	Roads	772
4	Street Lamps	130
5	Storm water Drain	468
6	Layout Approval	12
6	Admin Building	30
Total		1427