Initial Environmental Examination

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IND: Visakhapatnam Chennai Industrial Corridor Development Program (VCICDP)

Naidupeta Economic Zone Subproject – Augmenting utility services for Naidupeta Industrial Cluster

Prepared by the Government of Andhra Pradesh for the Asian Development Bank.

CURRENCY EQUIVALENTS
(as of 08 March 2016)

Currency unit	–	Indian rupee (Rs)
Rs1.00	=	$0.0149
$1.00	=	INR66.9940

ABBREVIATIONS

ADB	-	Asian Development Bank
APIIC	-	Andhra Pradesh Industrial and Infrastructure Corporation Limited
BGL	-	Below Ground Level
BOD	-	Biological Oxygen Demand
BIS	-	Bureau of Indian Standard
CPCB	-	Central Pollution Control Board
DO	-	Dissolved Oxygen
DoE	-	Department of Environment
PMC	-	Project Management Consultant
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EMoP	-	Environmental Monitoring Plan
ESO	-	Environmental and Safety Officer
GoAP	-	Government of Andhra Pradesh
GoI	-	Government of India
IEE	-	Initial Environmental Examination
IMD	-	Indian Meteorological Department
IS	-	Indian Standard
MFF	-	Multi Tranche Financial Facility
MoEF	-	Ministry of Environment and Forests
MSL	-	Mean Sea Level
MW	-	Mega Watt
NGO	-	Non - Government Organization
NOx	-	Oxides of Nitrogen
PIU	-	Project Implementation Unit
RF	-	Reserve Forest
ROW	-	Right of Way
PMSC	-	Project Management and Supervision Consultant
SPCB	-	State Pollution Control Board
SPM	-	Suspended Particulate Matter
SO_2	-	Sulphur Dioxide
SSI	-	Small Scale Industries

NOTES

(i) In this report, "$" refers to US dollars.
(ii) “INR” and “Rs” refer to Indian rupees

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EXECUTIVE SUMMARY

1. The Visakhapatnam-Chennai Industrial Corridor Development Program (VCICDP) is proposed to support the Government of Andhra Pradesh (GoAP) for infrastructure development, and policy and institutional reforms to stimulate economic growth and employment generation.

2. VCICDP will help boost manufacturing sector growth along the Visakhapatnam-Chennai Industrial Corridor (VCIC), which runs over 800 km from north to south covering almost the entire coastline of the state of Andhra Pradesh covering a population of 49.4 million and an area of 160,205 km^2. The VCIC is part of the East Coast Economic Corridor, which is India's first coastal economic corridor, and is poised to play a critical role in driving India's new "Act East Policy" and "Make in India" initiatives. The "Act East Policy" is a proactive initiative focused on, among others, increasing the integration of the Indian economy with the dynamic global production networks of the Association of Southeast Asian Nations.

3. VCICDP will complement the ongoing efforts of the Government of Andhra Pradesh (GoAP) to enhance manufacturing sector growth and create high quality jobs in the state of Andhra Pradesh.

4. This Initial Environmental Examination (IEE) is an environmental safeguard assessment report for the APIIC Industrial Infrastructure upgradation subprojects being proposed under the VCICDP. This IEE covers the proposed augmentation of utility services for the Naidupet Economic Zone.

5. This IEE aims to (i) provide critical facts, significant finding, and recommended actions; (ii) present the national and local legal and institutional framework within which the environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) to describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify who is responsible for carrying out the mitigation and monitoring measures.

6. Potential negative impacts were identified in relation to pre-construction and operation of the improved infrastructure, but no permanent environmental impacts were identified as being due to either the subproject design or location. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result some measures have already been included in the designs for the infrastructure. This means that the number of impacts and their significance have already been reduced by amending the design.

7. The public participation process has been conducted for both areas as a part of the public hearing and the feedback of the relevant stakeholders have been considered for the sub-project design and implementation to be undertaken during project detailed design and finalization of the IEE. The information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation.

8. The subproject's Grievance Redress Mechanism will provide the citizens with a platform for redress of their grievances and describes the informal and formal channels, time frame and mechanisms for resolving complaints about environmental performance.

9. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between APIIC, PMU, PMSC and the contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with.

10. The contractor will be required to submit to APIIC, for review and approval, site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following of the EMP to ensure no significant environmental impacts; (iii) monitoring program as per SEP; and (iv) budget for SEP implementation. No works are allowed to commence prior to approval of SEP.

11. A copy of the EMP/approved SEP will be kept on site during the construction period at all times. The EMP has been made binding on all contractors operating on the site and included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

12. The subproject is unlikely to cause significant adverse impacts because: (i) most of the individual components involve straightforward construction and operation, so impacts will be mainly localized; (ii) in most cases the predicted impacts are localized and likely to be associated with the construction process at designated location and are produced because the process is involving construction, obstruction at specific construction locations, and earth movements and storage and transportation of hazardous waste during operation phase of the sub-project; and (iii) being located in the industrial area and will not cause direct impact on terrestrial biodiversity values. The potential adverse impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures.

The proposed Naidupeta Cluster comprises of the Naidupeta MPSEZ, IP-Naidupeta and IP-Attivaram. Environmental Clearance (EC) is applied individually for each component of the cluster. Naidupeta MPSEZ has received Environmental Clearance. For IP-Attivaram the environmental appraisal committee at MoEF&C has recommended the project for issuance of Environmental Clearance and hence orders in this regards are awaited. Whereas for IP-Naidupeta, the public hearing is scheduled on Sept 20, 2016 based on which the draft EIA report will be updated and submitted to MoEF&CC for seeking approval.

13. Therefore as per ADB SPS, the subproject is classified as environmental Category B and does not require further Environmental Impact Assessment.

I. INTRODUCTION

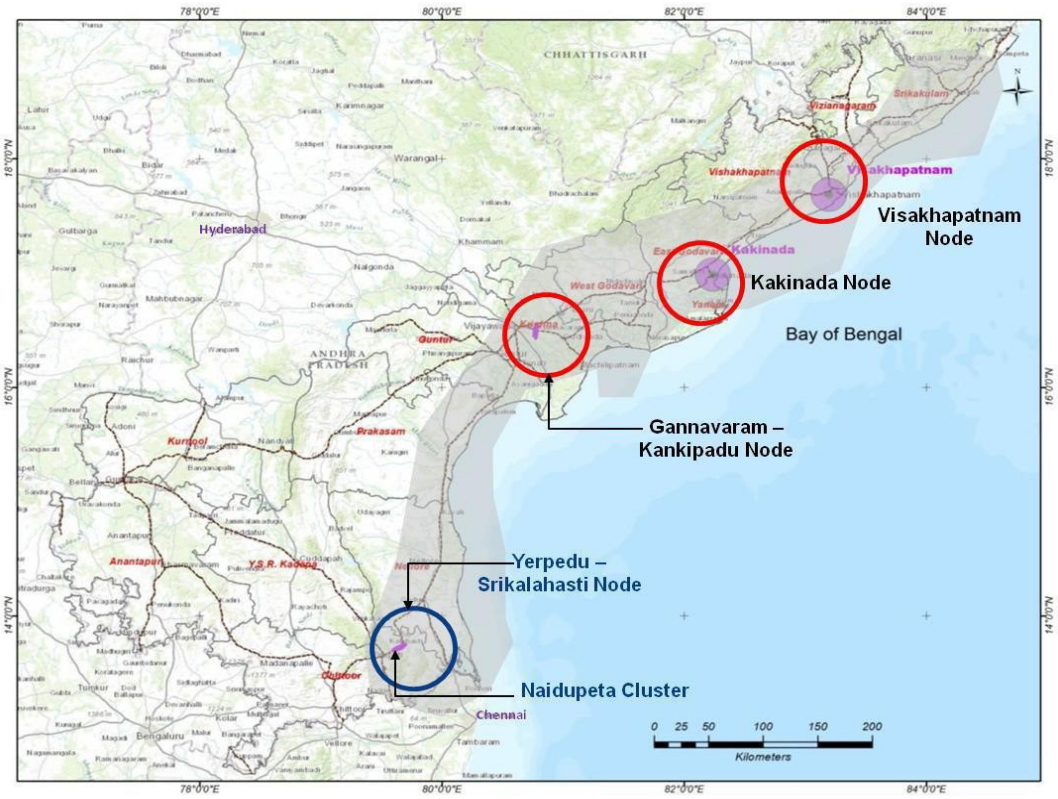
A. Background:

Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC) a wholly owned undertaking of Government of Andhra Pradesh (GoAP) has a mandate to develop industrial areas across the state. APIIC has developed around 300 Industrial Parks spread over an extent of 121,655 acres and in addition it has also developed sector specific industrial parks and special economic zones at strategic locations across the state.

The proposed project is Augmenting Utility services for Naidupeta Industrial Cluster

Naidupeta Cluster Overview: APIIC developed the Naidupeta Cluster comprising of a Multiproduct SEZ (2,549 acres), Naidupeta Industrial Park (1,244 acres) and Attivaram Industrial park (406 acres). Naidupeta Cluster comes under the proposed Vizag – Chennai Industrial Corridor (VCIC) within the Yerpedu – Srikalahasti Node.

Figure 1: Map location of Industrial Clusters and Nodes of Visakhapatnam Chennai Industrial Corridor (VCIC)



In view of the proposed VCIC and the envisaged developments, the demand for industrial land especially from engineering, Pharma, textile sectors is expected to increase and in order to cope up with the developments; APIIC is planning to upgrade the infrastructure in these Industrial clusters as per market needs. Naidupeta cluster is located 8 km west of Naidupeta town in Nellore district of Andhra Pradesh. The cluster comprises of the following estates.

Name of the Estate	Extent (in Acres)
Multiproduct SEZ	2,549
Naidupeta Industrial Park	1,244
Attivaram Industrial Park	406

Table 1: Major Industries in the Naidupeta Cluster:

S. No	Name of the Industry	Type of Industry	Extent (in acres)	Remarks
	Multiproduct SEZ (MPSEZ)			
1	M/s Greentech Industries	Manufacture of automobiles components, automobile engines & machinery	210	In operation
2	M/s Prime Electricals Pvt. Ltd.	Manufacture and export of power transformers	100	In operation
3	M/s Hemair Systems India Ltd.	Clean room technology equipment and HVAC equipment and other accessories	25	In operation
4	M/s Aurobindo Pharma Ltd.	Pharmaceuticals and Formulations	32	Under construction
	IP Naiduepta			
1	Hindustan National Glass and Industries	Manufacture of Container Glass	200	In operation
2	SKI Carbon Black (India) Pvt Limited	Manufacture of carbon black and power (byproduct)	60	In operation
3	Loyala Textiles Limited	Manufacture of Yarn and Fabric	54	In operation
4	BASF India Pvt Limited	Manufacture of Additive Mixtures	5	In operation
5	Chemsynth Laboratories	Manufacture of Bulk drugs	50	Yet to commence construction
	IP Attivaram			
1	DRA Industries	Manufacture of MS Billets and Construction Steel	100	In operation
2	Nithya Steels and Alloys	Steel Melting and Steel Rolling	20	In Operation

APIIC has identified the following components for further augmentation of the utility services of the Naidupeta industrial cluster under this package;

S.No	Project Component
1	Roads - MP SEZ - 19.80 KM
	Roads - IP Naidupeta 8.45 KM
	Roads - IP Attivaram 2.30 KM
2	Drains - MP SEZ 37.9 KM
	Drains - IP Naidupeta 21.3 KM
3	Water Supply and Distribution MP SEZ (HDPE) 27 KM
	Water Supply and Distribution IP Naidupeta(HDPE) 26 KM
	Water Supply and Distribution MP SEZ (DI) 4 KM
	Water Supply and Distribution IP Naidupeta(DI) 2 KM
	Construction of 20 Lakh Ltr ESR at IP Naidupeta
4	One Stop Service Center in MPSEZ (G+1 Floors) 17636 Sft
5	33/11KV Sub-station(2x8MVA)

	MP SEZ-1 No
	IP Naidupeta-1No
	Power Lines (33 KV & 11 KV)
	MP SEZ-45.00KM
	IP Naidupeta-29.00KM
	Ip-Attivaram-4.00KM
	Street Lights (Single & Double arm LED Type)
	MP SEZ -945 Nos
	IP Naidupeta-560 Nos
	IP Attivaram-100 Nos
	High Mast Lights
	MP SEZ – 8 Nos
	IP Naidupeta – 2 Nos
	IP Attivaram- 1 No.

B. Purpose and objective of the study

The environmental assessment study was conducted since March 2015 as part of feasibility study under ADB financed technical assistance to meet ADB requirements. The report will be updated as and when needed after the detailed design for the different components under the utility augmentation for the industrial cluster is completed. This version is based on pre-feasibility studies conducted, earlier EIA reports for the initial project stage, available primary and secondary data, due diligence studies and preliminary DPR reports prepared for the industrial utility augmentation at Naidupeta industrial cluster. The utility augmentation is one of the packages in the APIIC Infrastructure development subprojects under the Tranche 1 of VCICDP prior to initiation of civil works. It has been categorized as **Category 'B'** and hence an initial environmental examination (IEE) has been conducted.

The IEE report covers the general environmental profile of the study area and includes an overview of the potential environmental impacts and their magnitude on physical, ecological, economic, and social and cultural resources within the project's influence area during design, construction, and operation stages. An EMP was prepared that contains mitigation measures for significant environmental impacts during implementation of the project, environmental monitoring program, and the responsible entities for mitigation and monitoring. IEE has four basic objectives; (i) identify the environmental issues that should be taken into account due to project interventions (ii) determine the magnitude of potential environmental concerns and to ensure that environmental considerations are given adequate weight at planning/design stage (iii) identify need for further environmental studies or Environmental Impact Assessment (EIA) and, (iv) suggest enhancement measures, if any.

C. Extent of the IEE study

This IEE report has been prepared on the basis of pre-feasibility study and DPR, field investigations and surveys, stakeholder consultations and meetings to meet the requirements for environmental assessment process and documentation as per ADB's Safeguard Policy Statement (SPS, 2009). The extent of the IEE was decided considering all likely impacts and risks analyzed in the context of the project's area of influence encompassing:
(i) the primary project site(s) and related facilities like site clearance, utility shifting etc. (ii) associated facilities project viz. management and handling, storage of hazardous waste, availability and existence of hazardous waste management facilities, disposal of debris, construction camp etc. (iii) areas and communities potentially affected by cumulative impacts,

and (iv) potential impact from unplanned but predictable developments caused by the project that may occur at later stage or at a different location.

D. IEE Methodology

IEE commenced with an initial pre-feasibility site visit and review of the technical details provided by the APIIC and DPR consultants and preceding environmental assessment reports conducted for the project sites. This was followed by a reconnaissance site visit and discussion with the implementing agency to reconfirm the technical details of the proposed SUBPROJECTSs including a site visit to the existing SUBPROJECTS under construction at Naidupeta cluster. This helped identify environmental attributes which may get altered due to the project and incorporate additional information to the baseline environmental scenario/environmental setting of the project to meet the ADB Safeguard requirements. Further steps followed for IEE has been concisely described in following paragraphs.

1. Primary Data Collection

Inventory of all environmental features viz. terrain, geologically unstable areas, waterways/water bodies, road side vegetation, sensitive receptors, common property resources, utilities, flooding/water logging, and industries was conducted for the project sites. Since the proposed project sites are within the already allocated Industrial cluster zones of APIIC, it does not impact forest area and hence no bio-diversity study was undertaken.

2. Secondary Data Collection

Published reports, government websites, recognized institutions and relevant government departments were consulted to gather information and maps of the project influence area. For information on ambient air quality, soil quality, background noise level, surface and groundwater quality, environmental assessment done by DPR Consultants was referred.

3. Public Consultation

Besides consultations with the government agencies, consultations with local people/beneficiary population were held at all major habitations to collect baseline information to better understand of potential impacts and appreciate the perspectives/concerns of the stakeholders. Public hearing process has already been conducted for the Naidupeta Industrial Estate as a part of the EIA approval process and the Information gathered from this were integrated in project design and formulating of the EMP.

4. Other Tools

Remote sensing and GIS based land use map of the study area has been reviewed through recent satellite imagery and verified on the ground. Information collected from both primary and secondary sources has been summarized in **Table 2**.

Table 2: Primary and Secondary Information Sources

Information	Sources
Technical Details	APIIC and DPR Consultant
Technical details of proposed components under the package	APIIC and DPR consultant and site visits to Naidupet industrial estate and proposed component locations.
Climatic condition	Indian Meteorological Department Websites
Geology, Seismicity, Soil and Topography	State of Environment Report, Pollution Control Board, DPR and Primary Surveys

Land Use/ Land Cover	State of the Environment Report, Satellite Imagery based land use analysis
Drainage Pattern	Google Image, Detail Project Report and onsite observations
Forest/Vegetation	Forest Range Offices/State Forest Department, Andhra Pradesh
Archaeological / Cultural Heritage sites	Archaeological Survey of India
Status of fishing activity	District Fisheries offices
Air quality Noise, Soil and Water	Primary survey by DPR Consultants
Information	**Sources**
Hazardous Waste Management practice and requirements	APPCB, Detailed Project Report
River geo-morphology, hydrology, drainage, flood and patterns	Detailed Project Report, Consultation and site verification
Soil profile and measures to control soil erosion	Soil Conservation Department, Govt. Of Andhra Pradesh
Groundwater Conditions	Central Groundwater Board
Socio-economic environment	Different Govt. agencies/civic bodies, official websites maintained by state govt., census of India 2011, and public Consultation during the Field survey

5. Assessment of Potential Impacts

Potential significant impacts were identified on the basis of: analytical review of baseline data; review of environmental conditions at site; analytical review of the underlying socioeconomic conditions with the project influence area.

6. Preparation of the Environment Management Plan

An EMP for the project was prepared to specify the steps required to ensure that the necessary measures will be taken. The EMP includes the monitoring plan giving details of the resources budgeted and the implementation arrangements.

E. Structure of the report

The IEE has been structured as recommended in SPS, 2009. An introduction section has been included to have a general overview of the project. Executive Summary describing critical facts, significant findings, and recommended actions has been presented in the beginning of the report. The report has been compiled and presented as follows.

Executive Summary
Chapter I - Introduction
Chapter II - Policy, Legal and Administrative Framework
Chapter III - Description of Project
Chapter IV - Description of the Environment
Chapter V - Anticipated Impacts and Mitigation Measures
Chapter VI - Public Consultation and information disclosure
Chapter VII - Institutional Arrangements and Responsibilities
Chapter VIII - Institutional Capacity and Development
Chapter IX - Environmental Management Plan, Monitoring Plan and Grievance Redressal Mechanism
Chapter X - Conclusion and Recommendation

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

Screening and Categorization. The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact and are assigned to one of the following four categories:

i **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.

ii **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.

iii **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

iv **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

Environmental Management Plan. An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

Public Disclosure. The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, etc.), and a summary translated into Telugu/Hindi for the project affected people and other stakeholders. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

v For environmental category A projects, a draft EIA report at least 120 days before Board consideration;

vi Final or updated EIA and/or IEE upon receipt; and

vii Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

B. Environmental Legislation (National and State Laws)

Implementation of VCICDP will be governed by environmental acts, rules, policies, and regulations of the Government of India. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. Many of these are cross sector and several of them are directly related to environmental issues. The most important of these is the "Environmental Impact Assessment (EIA) Notification, 2006".

In addition to the EIA Notification, 2006, there are a number of other acts, rules and regulations currently in force that could apply to VCICDP. Salient features and applicability of these legislations are provided in Table 3. This presents specific requirements for the project. Annex 2 provides the environmental standards for air, surface water, groundwater, emissions, noise, vehicular exhaust and disposal to land/agricultural use of sludge and bio-solids.[1]

Implementation of the subproject will be governed by the national and State of Andhra Pradesh environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether national, state or municipal/local. Compliance is required in all stages of the subproject including design, construction, and operation and maintenance.

The summary of environmental regulations and mandatory requirements for the subproject is shown in Table 3.

Table 3: Applicable Environmental Regulations for Naidupeta Economic Zone Subprojects

No.	Legislation	Requirements for the Project	Applicability
1	National Environment Policy (NEP), 2006	Project should adhere to the NEP principle of: enhancing and conservation of environmental resources and abatement of pollution	The policy governing the environmental rules and legislations and is applicable to all the subprojects.
2	EIA Notification, 2006	Environmental clearances (EC)	The Naidupet Industrial zone including the above components has applied for obtaining Environmental Clearance from the MoEF.[2]
3	Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and its Rules, 1975	Consent for establishment (CFE) and consent for operation (CFO) from APPCB Compliance to conditions and disposal standards stipulated in the CFE and CFO	As Applicable to proposed subproject components.
4	Air (Prevention and Control of Pollution) Act, 1981, amended	CFE and CFO from APPCB as applicable	As applicable to proposed subproject components.

[1] During the design, construction, and operation of the project the PMU and PIUs will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

[2] Public Hearing was conducted on 28th July 2015 by the District Collector Nellore. Based on the outcome of the public hearing, the EIA report has been updated and submitted to MoEF for obtaining Environmental Clearance.

	1987 and its Rules, 1982	Compliance to conditions and emissions standards stipulated in the CFE and CFO.	CFE and CFO: (i) diesel generators; (ii) hot mix plants; and (iii) vehicles emitting air pollutants.
5	Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications: Environment (Protection) Rules, 1986 including amendments Municipal Solid Wastes (Management and Handling) Rules, 2000 Noise Pollution (Regulation and Control) Rules, 2000 Environmental Standards of Central Pollution Control Board (CPCB) Notification of Eco Sensitive Zones Wetland (Conservation and Management) Rules, 2010 Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2009	Solid waste and sludge generated at proposed facilities shall be disposed in accordance with the MSWM Rules. Compliance with noise standards Compliance to environmental standards (discharge of effluents) Restriction of activities (including construction, tree cutting, etc.) in the notified zones. There are no eco sensitive zones in or near the subproject locations. Applies to protected wetlands (Ramsar sites, wetlands in eco sensitive areas and UNESCO heritage sites & in high altitudes, and wetlands notified by Government of India) - Prohibits/ regulates activities within and near the wetlands. None of the subproject locations has protected wetlands. Rules defines and classifies hazardous waste provides procedures for handling hazardous waste. Requires Pollution Control Board's consent for handling hazardous waste. Procedure for storage of Hazardous wastes and provides procedures for recycling, reprocessing or reuse, important and export of hazardous waste.	As Applicable to proposed subproject components.
6	Contract Labour (Regulation and Abolition) Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Department of Labour, GoAP as principle employer. Contractor shall register with Labour Department, GoAP if inter-state migrant workmen are engaged. Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc.,	Applicable to all construction/civil works. APIICs to obtain Certificate of Registration. Contractors to obtain license from designated labour officer

7	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996	Cess should be paid at rate not exceeding 2% of the cost of construction as may be notified The employer is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer has to obtain a registration certificate from the Registering Officer.	Applicable to any building or other construction work and employ 10 or more workers
8	The Child Labour (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in all the subprojects.	No child below 14 years of age will be employed or permitted to work in all the subprojects.
9	Minimum Wages Act, 1948	All construction workers should be paid not less than the prescribed minimum wage	Applicable
10	Workmen Compensation Act, 1923	ompensation for workers in case of injury by accident	Applicable
11	Equal Remuneration Act, 1979	Equal wages for work of equal nature to male and female workers	Applicable
12	AP State Environment Policy	Follows the National Environment Policy, 2006 Project implementation should adhere to the policy aims	Applicable
13	The Motor Vehicles Act, 1988	Standards for vehicular pollution and prevention control. The authority also checks emission standards of	Applicable
		Registered vehicles, collects road taxes, and issues licenses. In August 1997, the Pollution under Control Certificate (PUC) program was launched in an attempt to crackdown on the vehicular emissions in the States. All the vehicles that will be used in construction of the subprojects will have to comply with the PUC norms set down under this act.	

14	Coastal Regulation Zone (CRZ) Notification 6th January 2011 Central Government have declared the coastal stretches of seas, bays, estuaries, creeks, rivers and back waters which are influenced by tidal action (in the landward side) up to 500m from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) & High Tide Line (HTL) as "Coastal Regulation Zone" (CRZ), as per the provisions of the CRZ Notification 6th January 2011.	The main objectives of the Coastal Regulation Zone Notification, 2011 are: to ensure livelihood security to the fishing communities and other local communities living in the coastal areas; to conserve and protect coastal stretches and; to promote development in a sustainable manner based on Scientific principles, taking into account the dangers of natural hazards in the coastal areas and sea level rise due to global warming.	Naidupeta Industrial Estate does not attract requirements under CRZ
15	Minor Mineral and concession Rules	For opening new quarries. Regulate use of minor minerals like stone, soil, river sand etc.	Applicable
16	The Mining Act (1952)	The mining act has been notified for safe and sound mining activity. The construction of road subprojects will require aggregates. These will be procured through mining from riverbeds and quarries	Applicable
17	Notification for use of fly ash from thermal power plants within 100km reaches of the project.	The MoEF had issued in 2009 a notification that all brick units within 100km radius of thermal power plants were required to use fly ash for making bricks as well as using it for construction activities like building or roads.	Applicable .
18	Public Liability and Insurance Act 1991	Protection from hazardous materials and accident.	Applicable
19	National Environment Appellate Authority Act (NEAA) 1997	Grievances process and how they will be dealt with.	Applicable
20	Explosive Act 1984 - For transporting and storing diesel, bitumen etc.	Safe transportation, storage and use of explosive material.	Applicable
21	The Factories Act, 1948 - The Andhra Pradesh Factory Rules	The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours and rendering information-regarding accidents or dangerous occurrences to designated authorities.	Applicable
22	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.	The Rules provide for mandatory preparation of On-Site Emergency Plans by the industry and Off-Site Plans by the district collector and the constitution of four tier crisis groups at the center, district, and local levels for the management of chemical disaster.	Applicable

23	Permission for extraction of ground water for use in road construction activities from State Ground Water Board.	Extraction of groundwater.	Applicable to rehabilitation and improvement of water supply. To be obtained prior to initiation of any work involving abstraction of groundwater
24	Permission for use of water for construction purpose from irrigation department	Use of surface water for construction	Applicable. To be obtained prior to initiation of any work involving use of surface water for construction

C. Government of India Environmental Assessment Procedures

The EIA Notification, 2006, sets out the requirement for environmental assessment in India. This states that prior environmental clearance (EC) is mandatory for the development activities listed in its schedule, and must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

(i) Category A projects requires EC from MoEF. The proponent is required to provide preliminary details of the project in the prescribed form, after which an Expert Appraisal Committee (EAC) of the MoEF prepares comprehensive terms of reference (ToR) for the environmental impact assessment (EIA) study within 60 days. On completion of the study and review of the report by the EAC, MoEF considers the recommendation of the EAC and provides the EC if appropriate.

(ii) Category B projects require EC from the State Environment Impact Assessment Authority (SEIAA). The State-level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study), and prepares ToR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the EC based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

Naidupeta MPSEZ has received Environmental Clearance whereas for IP-Attivaram the environmental appraisal committee at MoEF&C has recommended for issuance of Environmental Clearance and orders in this regards are awaited. Whereas for IP-Naidupeta, the public hearing is scheduled on Sept 20, 2016 based on which the draft EIA report will be updated and submitted to MoEF&CC for seeking approval

D. International Environmental Agreements

33. India is a party to the following international convention that may apply to this subproject, especially in management and handling of Hazardous Wastes.

Table 4: International Agreements and Applicability to Naidupeta Economic Zone Subproject

No.	Agreement	Requirements for the Project
1	United Nations Framework Convention on Climate Change (UNFCCC), 1993	The UNFCC is an international environmental treaty with the main objective to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. India signed the UNFCC on 10 June 1992 and ratified it on 1 November 1993. The project will ensure that all construction activities will not significantly increase the GHG emissions and ensure that design of all infrastructure are resilient climate change impacts

Government Regulatory Body. The Andhra Pradesh Pollution Control Board (APPCB) is the main state-level regulatory agency that is responsible environment protection and pollution control. APPCB through its Regional Offices (RO) in Naidupeta region will regulate environmental protection related activities. Regional Officer's at these locations will monitor the subprojects operation and compliance with the standards.

APPCB monitors the environmental parameters to check whether or not it meets the standards stipulated in its consent order. Surveillance monitoring by APPCB staff, at least once a year, by visiting the project sites and collecting the sample and testing at APPCB laboratory, and specific monitoring in case of public complaints.

E. ADB's Safeguard Requirement

The Asian Development Bank has defined its Safeguard requirements under its "Safeguard Policy Statement" (SPS, 2009). Project categorization has been done using REA checklist and the project is categorized as category B. As per SPS 2009, category B projects warrants preparation of an IEE.

F. Grievance Redress Mechanism

People that are affected by the impacts of this subproject will have a channel to register their grievance. This report and the EMP describe a grievance redress mechanism (GRM) to document and resolve complaints from affected people. The proposed GRM was explained to the attendees of the public forum. The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple points of entry and modes of access, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. Opportunities for confidentiality and privacy for complainants will be honored where this is seen as important.

III. DESCRIPTION OF THE PROJECT

The augmentation of utility services is proposed to include the following components:

a) Internal Roads
b) Storm Water Drains
c) Water Supply (Bulk and Distribution)
d) Power Supply
e) One Stop Service Centre
f) External Connectivity

A. Connectivity

The main access to the cluster is Naidupeta – Venkatagiri Road (MDR Road). It is a two lane road with good riding quality. APIIC has constructed a bypass for Menakuru Village along this road.

Naidupeta Cluster is well positioned in terms of external connectivity. Asian Highway 45 (earlier known as NH5) connecting Chennai with Kolkata is around 12km from the cluster and can be reached through the existing road network.

Tirupati Airport (Gateway airport for VCIC Node) is located around 60km and Krishnapatnam Port (Gateway port for VCIC Node) around 75km from the Naidupeta Cluster. Government of India has plans to upgrade the Tirupati Airport into an International Airport. This will be one added advantage for the cluster.

The cluster has also the advantage of Kattupalli Port and shipyard, Ennore Port and Chennai Port which are located in a distance of 100km.

B. Infrastructure Development by APIIC

I. Internal Road Network

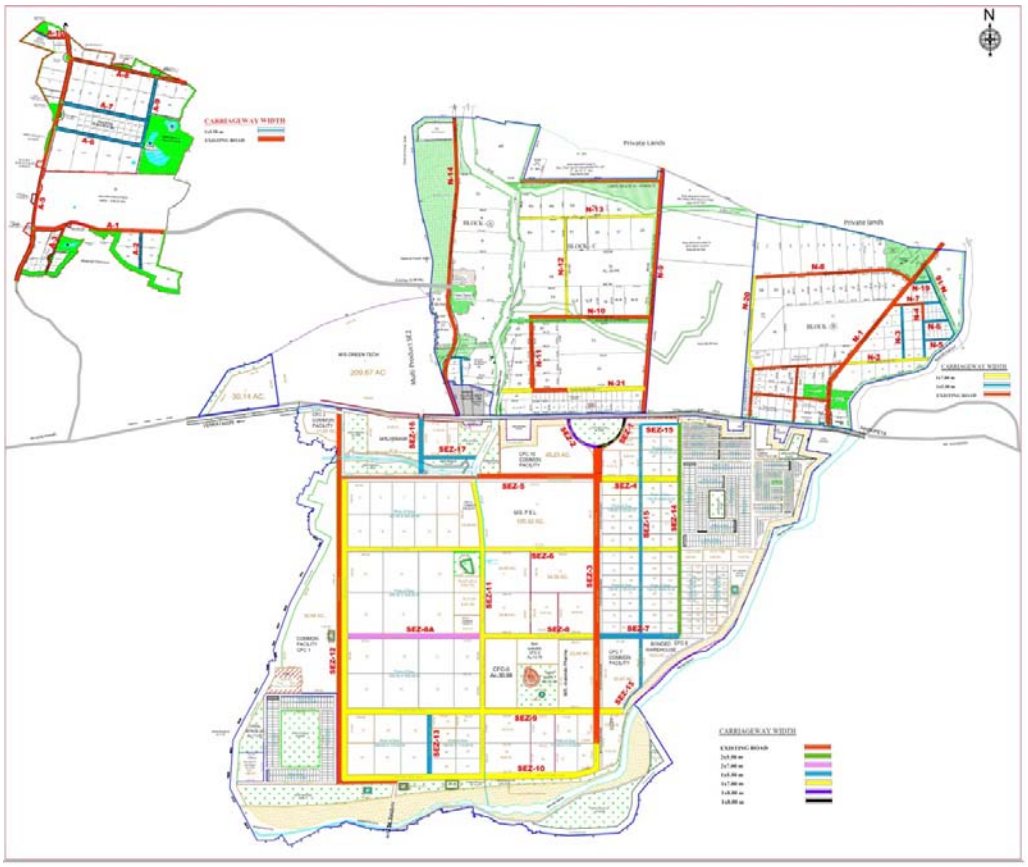
The internal roads developed by APIIC within the cluster are shown in **Figure 2** below.

The Details for the existing road length is presented and the **Table** indicates the existing roads. The existing roads in MPSEZ, IP Naidupeta and IP Attivaram are having good riding quality.

Table5 Details of existing roads developed by APIIC

Area	4-Lane divided carriageway	2-Lane carriageway	Remarks
MPSEZ-Naidupeta	2,180	2,540	With earthen shoulder on either side
IP-Naidupeta	1,800	1,750	Strom water drain (open type) under construction
IP-Attivaram	-	3,630	With earthen shoulder on either side

Figure 2: Internal Road Network



MPSEZ Road

MPSEZ 45m road

MPSEZ 45m road

IP-Naidupeta road

IP-Attivaram road

The existing roads in MPSEZ, IP Naidupeta and IP Attivaram are having good riding quality.

II. Boundary Wall

APIIC constructed peripheral boundary wall around the processing area of MPSEZ. No boundary wall noticed for IP Naidupeta and IP Attivaram

MPSEZ processing area SW boundary wall

Boundary Pillars for IP areas

III. Storm Water Drains:

Currently APIIC is constructing storm water drains (open type) along the existing Main Roads within IP Naidupeta.

Internal drains under construction

IV. Power

Transmission Corporation of Andhra Pradesh (APTRANSCO) established 132/33kv substation in IP Naidupeta area. The existing industries are connected through 11kv overhead lines from this substation. In view of the proposed up gradation, there is a need to augment the capacity of this substation

Existing 132/33KV sub-station

Existing 132/33KV sub-station

Details of existing 132/33 KV SS

Capacity of Power transformers: 1x 31.5 MVA and 1x 15 MVA

Total capacity is 46.5 MVA. It is to be checked for provision for enhancement of PTR (Power Transformer) as the total 46.5 MVA load is not adequate as per the requirements. Further, following provision and space need to be made at 132/33KV SS to cater the loads as mentioned below.

Power Transformers:	2x80 MVA
Bay extension 132 KV side:	1 no.
132KV. line:	Double Ckt. Line
33KV Feeders:	Space for 18 nos feeder bays, and space provision for 4 Nos Bay extensions.
Control Room:	Space for Breaker panels and Power Transformers panel.

V. Water supply

The existing units in MPSEZ, IP Naidupeta and IP Attivaram are using ground water to meet their water requirement. APIIC is developing a 2mld water supply scheme for existing units in MPSEZ and IP Naidupeta.

Figure 3 shows the proposed water supply scheme. The scheme includes Filter wells with pump rooms in Mamidi Kaluva, Sump, Raw water balancing reservoir (4 Lakhs gallon capacity) with a pump house (3 x 15 HP) to pump raw water to the overhead reservoir (2 lakh gallons capacity. No water treatment facility noticed in the scheme.

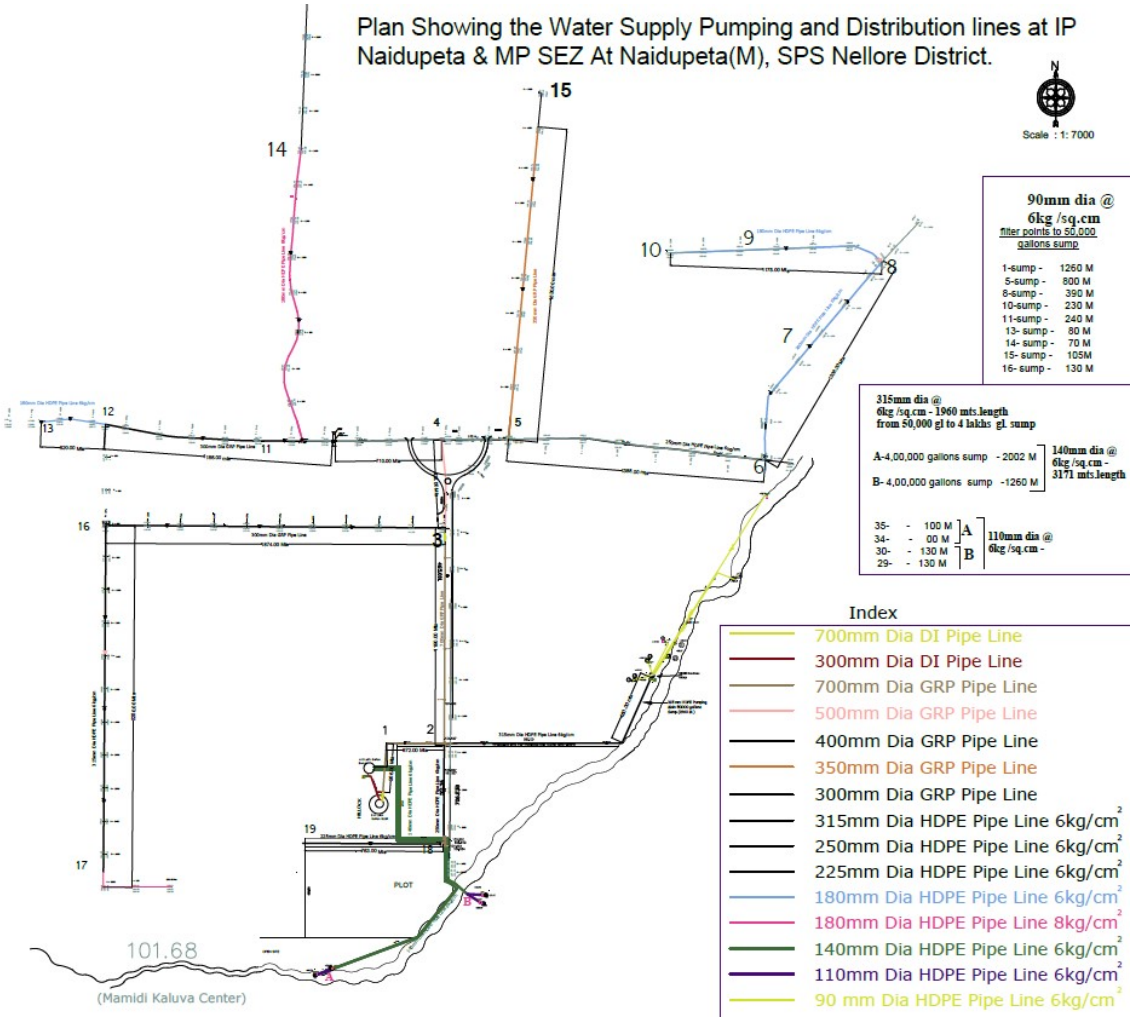


Figure 4: Existing Water Supply Network

Under construction 4 lakh Gallons GLSR

Under construction 2 lakh Gallons GLSR

Construction pump house under construction pipe works

Under

C. **Infrastructure Design Framework**

I. **Internal Roads**

Design Standards for Road Development

The design philosophy is based on IRC standards with latest additions and amendments, prescribed for design, execution, maintenance and safety during construction and service. The geometric and loading standards comply with the current practices adopted and recommended by IRC and MoSRT&H which are suitable for the traffic and engineering characteristics.

Terrain Classification

The MPSEZ-Naidupeta and Industrial Parks are located in plain terrain (cross slope of ground –0 to 5%). Geometric standards as per IRC 86 - 1983 are applicable.

Road Network

The total length of the internal roads proposed in MPSEZ – 19.45km, IP-Naidupeta – 8.45 km and IP-Attivaram – 2.3km. The internal roads will be developed with different RoW from 12m – 45m as presented in the Table below:

Table 6 Internal road length with varies RoW

Naidupeta Cluster	**Road Length (in Km)**					
	45 m	36 m	24m	20m	18m	15m
MP SEZ	6.6	8	3.5	1.7	-	-
IP Naidupeta	-	-	-	-	8.5	-
IP Attivaram	-	-	1.8	-	0.3	0.2

The road cross-sections are developed based on the RoW provided for various categories of roads. The cross sections also include foot path cum utility corridor such as storm water, potable water, with provisions for including sewage water, recycled water lines in future . The cross sectional elements for each RoW are given below.

Table 7: Typical cross section elements

Cross Sectional Elements	**45m RoW**	**36m RoW**	**24m RoW**	**20m RoW**	**18m RoW**	**15m RoW**
Carriageway (m)	7	5.5	5.5	8	7	5.5

Median (m)	0	0	0	0	0	0
Reserved for Utilities	38	30.5	18.5	12	11	9.5

Design Speed

The design speed considered is 40 kmph for the aspect of safety consideration. Horizontal alignment and vertical gradient of the roads are designed as per IRC standards considering natural ground slope at site.

Geometric Design

The proposed internal road network plan is designed as per 'IRC 86-1983: Geometric design standards for urban roads in plain'. Since IRC standards do not specify standards for median widths, raised or sunk median, shyness strips etc., these aspects are proposed as per 6/4 lane manual and MoRT&H circulars.

Table 8: Summary of design standards for road geometrics

S. No	Items	Standards
1	**Stopping Sight Distance (SSD) for 40kmph**	
i	Desirable	100m
ii	Minimum	50m
2	**Horizontal curvature**	
i	Desirable radius beyond which no super-elevation is required	280m
iii	Absolute minimum requiring 5% super elevation	150m
S. No	**Items**	**Standards**
3	**Vertical Alignment**	
i	Minimum distance between PVI	150m
ii	Minimum length of vertical curve	20m
iii	Maximum grade change not requiring vertical curve	1.0%
4	**Gradient**	
i	Minimum (where pavement has kerb/crash barrier on both sides)	0.3%
ii	Maximum Ruling	2.0%
iii	Maximum Limiting	3.3%
5	**Super elevation**	5% (max.)
6	**Minimum width of side walk (in urban stretches)**	2.0m
7	**Minimum Median width**	2.0m

Intersections

There are 3 legged and 4 legged intersections in MPSEZ and IPs as per the master plan. The intersections are designed in accordance with IRC: SP: 41-1994, 'Guidelines for the Design of

At-grade Intersections in Rural and Urban Areas'. The minimum turning radius of 20 m is considered at intersection for more usage of long vehicle type in the MPSEZ and IPs.

Embankment

The height of the embankment shall be based on the final road levels. The following principles are followed for fixing the road level.

i) The top of the sub-grade is at least 1.0m above the high flood level/high water table/pond level. However in exceptional circumstances, where it is found difficult to fulfil this criterion without needing reconstruction or raising in substantial length, a minimum difference of 0.6m between the top of sub-grade and HFL/high water table/pond level was ensured.

ii) The road level of the new carriageway is not lower than the existing carriageway unless it improves vertical profile and also satisfies all other requirements.

iii) To fulfil the minimum free board requirement and provide smooth vertical profile for portions forming approaches to structures.

iv) Embankment designed to ensure the stability of the roadway and incorporated only those materials, which are suitable for embankment construction.

v) Side slopes shall not be steeper than 2H: 1V and where necessary, the embankment shall be retained by a retaining structure.

vi) Where the embankment is to supported on a weak stratum provided appropriate remedial/ground improvement measures.

The side slopes will be protected against erosion by providing grass turfs/ vegetative cover, stone/C.C. block pitching, geo-synthetics, gabion walls or any other measures depending on the height of the embankment, type of soil involved and susceptibility of soil to erosion in accordance with IRC: 56-1974. Pitching on the slopes shall be done in accordance with MOST Specifications.

Traffic Control Devices

Road side furniture is proposed in accordance with IRC 67:2012. These include roadside signs, overhead signs, and route marker signs and curb mounted signs along the entire site.

Pavement markings are proposed in accordance with IRC 35:1997. These markings are applied to centre line, edge line, continuity line, stop line, give way lines, diagonal/chevron markings, zebra crossing and at parking areas.

RoW Boundary stones are proposed at an interval of 50m on both sides. Traffic Blinker Signal (L.E.D) is planned at intersections and median opening locations if necessary.

Overhead Signs

Overhead gantry signs are proposed at entry gates for MPSEZ and IPs to ensure the destination place identification by road users. The size and specifications are as per clause 7.4 of IRC-67-2012.

Road Delineators

Roadway indicators are intended to delineate the edges of the roadway so as to guide the drivers about the alignment. Hazard marker is proposed to define obstructions like guardrails and abutments adjacent to the carriageway. Object marker is used to indicate hazards and obstructions within the flow path. The design, application, criteria for use, placement and spacing of these three types of delineators is proposed as per IRC-79-1981.

Road Studs

Road studs are proposed to improve the visibility during night time and wet weather conditions which are prismatic retro-reflective type two way markers conforming to ASTM D4280. Solar studs are proposed for the location uncontrolled pedestrian crossings and approach side of major and minor junction at spacing of 8m on carriageway marking. White colour road studs are used at locations where lane marking is in white colour and amber colour is used where lane marking is in amber colour. Red colour may be used to indicate no entry locations.

Roadside Safety Barriers

Generally roadside safety barriers is proposed at hazard locations like roadside rock mass, culverts, pipes and headwalls, cut slopes, retaining walls, lighting supports, traffic signs, signal supports, trees and utility poles. Crash barrier of specification as per six laning manual was provided conforming to Figure 9.1 of IRC-SP-87:2013.

Pedestrian Guardrails and Facilities.

Pedestrian guard rails is proposed as per the provisions laid in IRC 103:1988 if required

Access Control

Median opening of not less than 20m is proposed on median and separators for the traffic movement from one side to other side direction and to access service lane.

Pavement Design

The Cementitious sub base along with SAMI is suggested for Internal Road Pavement. conforming to IRC- I**RC: 37- 2012** guidelines. Design life considered is 20 years. Sub-grade having 8% CBR is considered for the pavement design. The pavement composition of the roads in the site is arrived based on cumulative number of standard axle to be expected during design life.

Table 9: Pavement Composition

S. No	Pavement Composition	Existing Road Pavement Composition (mm)*	Proposed Pavement Composition for the Internal Roads (mm)
1	Bituminous concrete	25	30
2	Dense bituminous macadam	60	-
3	Wet Mix macadam	250	-
	Aggregate interlayer with SAMI	-	10
	Cement Treated Base	-	150
4	Granular sub-base	335	250
5	Subgrade	225	500

* Based on the information provided by client on existing road pavements

II. Storm Water Drains

Storm water drainage arrangement is proposed along road side to cater water from the road surface and adjoining land area of MPSEZ and IPs. Accordingly each road side drain runoff is arrived and connected to road side drain on down steam side, forming as grid type arrangement based on the natural slope (gravity flow) which has finally to be discharged into natural steam (Mamadi Kalava) located south-east side MPSEZ. The surface and sub surface drainage system is designed as per IRC SP: 42 and 50 for a 5 year return period. A minimum longitudinal gradient of 0.3% is maintained in such way attain the minimum self-cleaning velocity of storm water drain. The longitudinal pipe with inlet chamber at selected interval of storm water drain is proposed for ease and eco-friendly construction at site.

It was observed that, open rectangular drains are under construction in IP-Naidupeta. Hence open rectangular/ trapezoidal type storm water drain is proposed along both side of the new road in IP-Naidupeta and IP-Attivaram. In MPSEZ-Naidupeta, open box type drains are proposed on both sides of the proposed roads.

Hydrologic Design

Hydrologic analysis is an important step prior to the hydraulic design of road drainage system. Such analysis is necessary to determine the magnitude and duration of flow. Hydrological data required for design include drainage area map, water shed delineation, arrow indicating direction of flow, outfalls, other surface drainage facilities, ground surface conditions, and rainfall intensity for the storm duration. Factors which affect runoff are size and shape of drainage area, slope of ground, land use characteristics, geology, soil types, surface infiltration and storage, storm duration and rainfall intensity for the region.

Rational method is a universally accepted empirical formula relating rainfall to runoff and is applicable for small catchment area not exceeding 50sq.km. Once the quantity of runoff is determined, the stage is set for the next step which is hydraulic design of the drain. The hydraulic capacity of the drain should be checked to ensure that it is capable of handling the expected flows without affecting the traffic and the road structure.

Where the corridor traverses land with perennial water logging, road surface water shall be drained on to these abutting water bodies, to maintain balance of water bodies affected due to the road construction. Embankment is suitably protected by providing stone pitching/turfing to protect against erosion of slopes. Suitable toe protection will be provided in case of embankments in water logged areas.

Balancing culverts are provided to balance, crossing minor streams and water bodies on either sides of the external connectivity road to NH5.

The culvert location are finalised based on necessity for crossing storm water pipe line, water, power, wastewater pipelines, and telecom lines from one side to another side of carriageway. The cross sectional elements of the culvert structures is provided in accordance with the requirements of MoRTH specifications which states that the basic approach for deciding the width of structures is that “the overall width of all bridges irrespective of their lengths or location is compatible with that of the road adjacent to it”. Hence all culverts should have width between the outermost faces of the kerbs equal to the roadway width of the approaches.

III. Water Supply (Distribution)

The water demand for MPSEZ, IP Naidupeta and IP Attivaram has been estimated considering the product mix firmed up in consultation with APIIC officials, the existing industries located in the cluster. The estate wise demand is given in the following table.

Table 10: Total Water Demand for MPSEZ and IPs

S No	Project area	Total Water Demand, (MLD)	Greywater Horticulture Purpose (MLD)	Total Water Demand, (TMC)
1	MPSEZ, Naidupeta	12.9	7.5	**0.17**
2	IP-Naidupeta	6.4	3.1	**0.08**
3	IP-Attivaram	1.4	0.7	**0.02**
	Total	**20.7**	**11.3**	**0.27**

The total water demand for Naidupeta Cluster is estimated as 20.7 MLD. The water requirement including grey water and horticulture purpose is also worked, which is around 11.3 MLD. In case if the wastewater is proposed to be reused then the net fresh water demand will be around 11.4 MLD

The bulkwater for the Naidupeta cluster will be sourced from Telugu Ganga Canal near Utlapalli Village, which is around 20km west of Naidupeta Cluster. APIIC propose to draw 0.27 TMC for the Naidupeta Cluster. ***APIIC has received the approval from I&CAD department to tap water from Telugu Ganga Canal.***

At present APIIC is constructing service reservoirs of 4 lakh and 2 lakhs gallons within in MPSEZ to serve MPSEZ and IP Naidupeta.

The proposed distribution system is designed to achieve 100% coverage (with respect to Roads). Pipeline network is proposed on either sides of the road as shown in the typical road cross sections. HDPE Pipelines are proposed for the distribution network

The distribution system is designed for a minimum residual pressure of 7 m (for single storey) and maximum of 22 m at consumer end. Hydraulic design of distribution network is carried out using Bentley's Water GEMS v8i software. HDPE pipes are selected for distribution network of water supply. Minimum pipe size of 100mm diameter is considered for design of distribution network. Service reservoirs (OHT/ELSRs) proposed at such a location that minimum residual pressure of 7 m has will be achieved at consumer end/each node of the distribution network of the particular zone.

IV. Power Supply

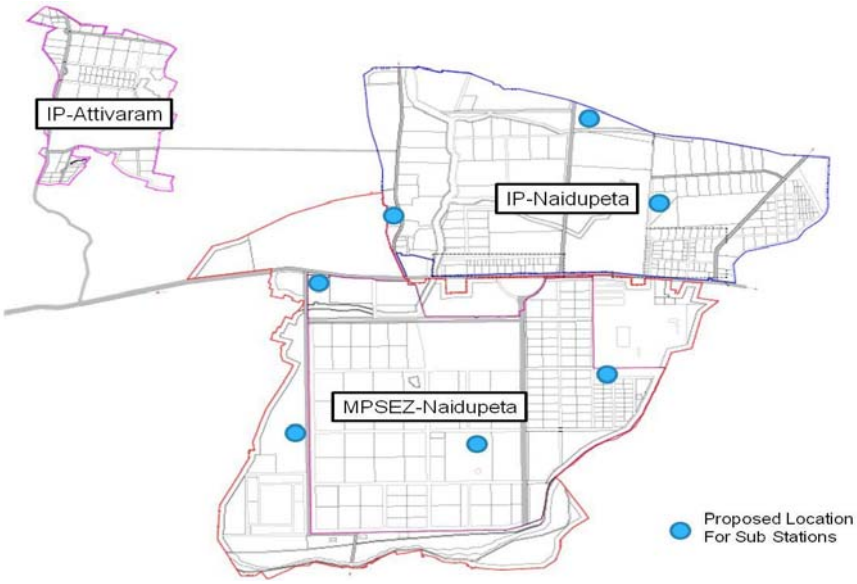
Power Demand

The total load estimated for MPSEZ and IP Naidupeta is around 117 MVA. APIIC propose to develop the distribution system in a phased manner and to begin with APIIC intends to develop the facility for a connected load of 60 MVA (40 MVA for MPSEZ and 20 MVA for IP Naidupeta)..

Power Supply Distribution Network Plan

The incoming power supply will be drawn from the nearest APSPDCL 132KV/33 KV substation located in IP-Naidupeta.It is proposed to connect each 33/11KV substation through 33 KV feeders from 132/33KV as incoming source with 33KV Overhead line Double Circuit(DC) on M+6 type towers running by the side of the road. It is proposed to provide supply to plots through 11KV DC overhead line on 11mts spun poles and on existing M+6 type towers running on road side of plots to. The system has also provision

of interlinking with other feeders in case of failure of respective feeders; this will enable uninterrupted power supply to the end users.



It is proposed to supply the power through four 33/11KV substations to users of processing area of MPSEZ-Naidupeta and IP Naidupeta. The locations of these substations are shown in the figure based on the load center.

Since APIIC is proposing to create the facilities in a phased manner, hence in the present package APIIC is planning for one substation in MPSEZ and IP Naidupeta.

Street Lighting

It is proposed to illuminate the MPSEZ and IP-Naidupeta area with LED Lights. For the Internal area, 120 W street lights at 30m interval are proposed, whereas on the peripheral road 7W street lights are proposed. High mast towers fitted with LED lamps are also proposed for illumination at road junctions and entry / exit point.

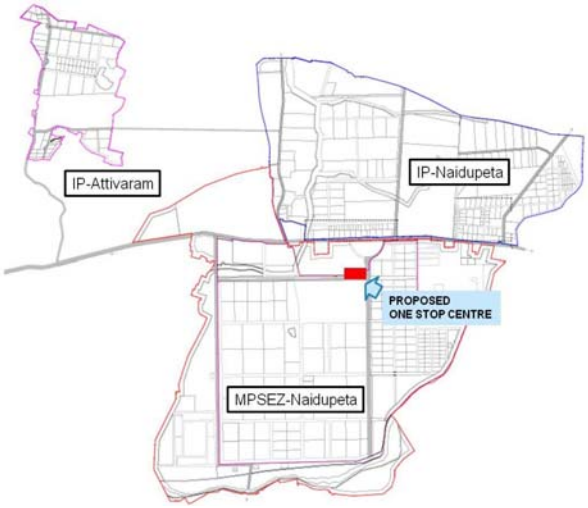
V. One Stop Service Centre

One stop service centre is an office building; ground +1 structure measuring 20,000sft. The building will accommodate

- Business centre
- Post office
- Bank
- Freight operator
- Office space
- Health centre (Away from main building)

Location

One stop service centre is located on the northern side of the layout abutting the main road. This building will be facing north and have parking facilities for cars and two wheelers at walk able distance. This building will be surrounded by landscape and water bodies.



This building shall be rectangular in plan with approx. 5,000 sft in ground floor and 10,000 sft in first floor. The first floor of this building will be cantilevered on all sides. This will shade the ground floor of the building and also as covered car parking for the executives.

Zoning

The ground floor will accommodate public areas like post office, bank, food court, freight operation and the first floor shall have semi public and private office spaces for executives and staff as per requirement and hierarchy. In addition, rest rooms and pantries are provided in the first floor. A separate health centre is provided as part of one stop center.

IV. DESCRIPTION OF THE ENVIRONMENT

A brief description about the existing environment, including its physical and ecological resources, economic development of the region, and issues relating to quality of life are presented in this section. Broad aspects on various environmental parameters (geology, soil, topography, climate, land use, water resources, water quality, air quality, noise quality, tourism, cultural resources etc.) which are likely to be affected (direct or indirect) by the proposed road widening project are covered. These aspects are covered in broader geographic extent to present the entire project region.

Nellore district is considered as the Project Influenced Area (PIA) District /General Study Area. As a primary requirement of the environmental and social screening process, the Core Study Area (CSA) will be Naidupeta Cluster comprising of Naidupeta MPSEZ, IP-Naidupeta and IP-Attivaram.

A. District Profile[3]

Nellore is the southernmost district of Andhra Pradesh bordering Tamil Nadu. It lies between $13^0$14' and $15^0$07' N Latitudes and $70^0$05' and $80^0$05' E Longitudes. The district is bounded on the east by the Bay of Bengal, on the south by the Tamil Nadu state and partly the Chittoor district and on the west by Veligonda Hill range which separates it from Cuddapah District and on the north by Prakasam District.

The eastern portions of the district are fairly fertile and prosperous. The western portion comprises wide stretches of wasteland containing lesser number of villages. The sandy coastal belt extends for 5 to 6 km interior from sea. There are numerous backwaters along the coast and the best known among them is the Pulicat Lake. Towards the extreme southeast is the island of Sriharikota, a rocket launching station of Indian Space Research Organisation, which is a low sandy track lying between Pulicat Lake and the sea.

Agriculture is the main occupation in the district. About 70 percent of the work force is dependent upon agriculture either as a farmer or as agriculture labour. Nellore is also famous for quality rice and aquaculture. The district is called the "shrimp capital of India" due to its high production of cultured shrimp.

Relief and Slope

The district is generally flat with low elevation and is a part of the Carnatic plain. It generally rises from the Bay of Bengal to Veligonda hills which runs in northwest direction from south of Venkatagiri. The Mean Sea Level varies from 32 to 52 m.

Geological Profile

A major portion of the district 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. The Baironkonda Quartzites, Cumbum shales of Nallamalai series of Upper Cuddapah Group occur in western margins of the district. Veligonda hills have been subjected to strong compressional forces. Laterite cappings of sub-recent age are seen over the crystallines in Kavali, Naidupeta and Sullurupet areas.

Hydrogeology

Hydro-geologically, the rock types occurring in the district are classified as consolidated, semi-consolidated and unconsolidated formations. Ground water occurs in almost all the formations and potentially depends on nature of geological formation, structure, topography, rainfall etc.

[3] District Planning Map Series for Nellore District prepared by the National Atlas and Thematic Mapping Organization, Department of Science and Technology, Government of India, is referenced for preparing the sections of District Profile, Relief and Slope, Geological Profile, Hydrogeology, Soils and Land Use/Land Cover.

The yields of wells depend on the recharge conditions and will reduce drastically in drought situations.

Soils

The soils of the district are classified as black, red and sandy. The soils range from somewhat excessively drained to moderately drained. The red soil is predominant with 40% of the area in the district whereas a belt of sand runs along the sea coast. The black cotton soil and sandy looms occupy 23% and 34% of the area respectively.

Land Use/Land Cover

The general land use and cropping pattern shows that out of the total geographical area, 43.42% alone is arable land whereas 18.7% of the area is covered by forests. The rest is barren and uncultivable land. The net sown area is 25.75% while cultivable wasteland and fallow land constitute 17.67%. Nearly 35% of the area is irrigated by canal, tank, tube well and lift irrigation. Important crops grown in the district are paddy, bajra, sugarcane, groundnut, fruit, vegetable, chilly, cotton and tobacco. Sunflower is gradually gaining importance and is preferred by most farmers.

Meteorology

The nearest Indian Meteorological Department (IMD) station is Nellore. The climatological data for Nellore published by the IMD, based on daily observations at 08:30 and 17:30 hour IST for a 30year period (1970-2000), is presented in **Table 6.** The monthly variations of the relevant meteorological parameters are reproduced in the table.

Table 11 Climatological Summary – Nellore Region

Month	Temp (°C)		Rainfall (mm)		Relative Humidity (%)		Station Level Pressure hPa		Mean Wind Speed (km/h)	Predominant Wind Directions (From)	
	Daily Max.	Daily Min.	Total	No. of days	08:30	17:30	08:30	17:30		08:30	17:30
Jan	29.9	20.3	9.7	0.9	86	65	1013.3	1010.1	5.0	NW	NE
Feb	32.4	21.8	1.7	0.2	82	62	1011.6	1008.3	6.3	SE	SE
Mar	35.0	23.4	1.5	0.2	77	61	1009.8	1006.2	7.6	SE	SE
Apr	37.9	26.1	11.0	0.4	71	63	1007.1	1003.2	9.0	SE	SE
May	39.8	28.1	30.1	1.3	63	55	1003.9	1000.2	9.2	W	SE
Jun	38.1	28.3	31.1	3.5	63	51	1002.4	998.6	10.1	W	W
Jul	35.9	26.9	75.4	6.0	70	56	1003.1	999.5	9.4	W	W
Aug	35.1	26.7	85.2	6.4	70	56	1003.8	1000.2	9.5	W	W
Sep	35.2	26.3	91.6	5.6	74	63	1005.7	1001.9	7.5	W	W
Oct	32.6	25.0	265.9	8.9	82	72	1008.2	1005.0	5.6	NW	NE
Nov	29.9	23.0	316.6	9.1	85	75	1010.7	1007.9	5.8	NW	NE
Dec	28.9	21.2	102.5	4.0	87	71	1013.3	1010.3	5.8	NW	NE

The observed meteorological data for temperature, rainfall, relative humidity and mean wind speed are presented in **Figure 4-1** to **Figure 4-4**.

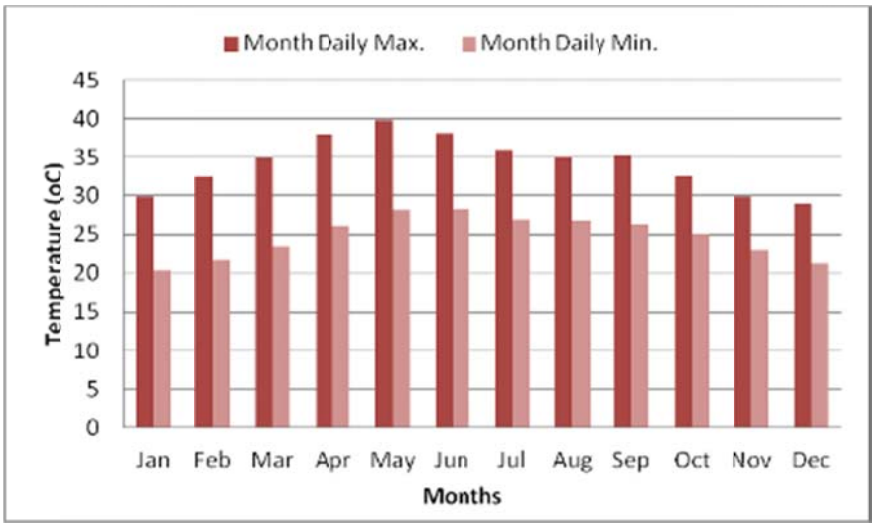


Figure 4-1: Variations in Temperature

Hottest month is May and average daily temperature is 39˚. Temperature gradually increases from January; with onset of the southwest monsoon the temperature gradually decreases.

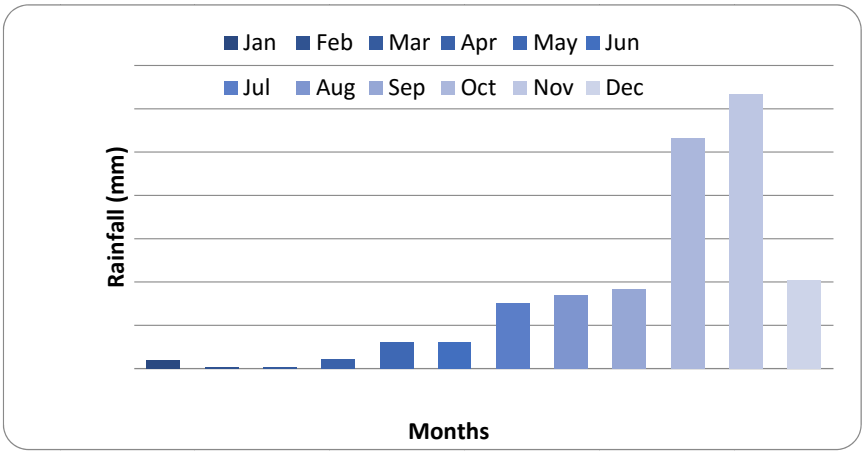


Figure 4-2: Annual Rainfall

The district lies in an area of precarious and uncertain rainfall. As such, the climate of the district is generally dry and salubrious. The average normal rainfall is 1,000 mm. Both the southwest and northeast monsoons contribute to the rainfall in the district. The rain from former monsoon is received between June and September. The principal rainfall is received during the latter monsoon that is between October and December

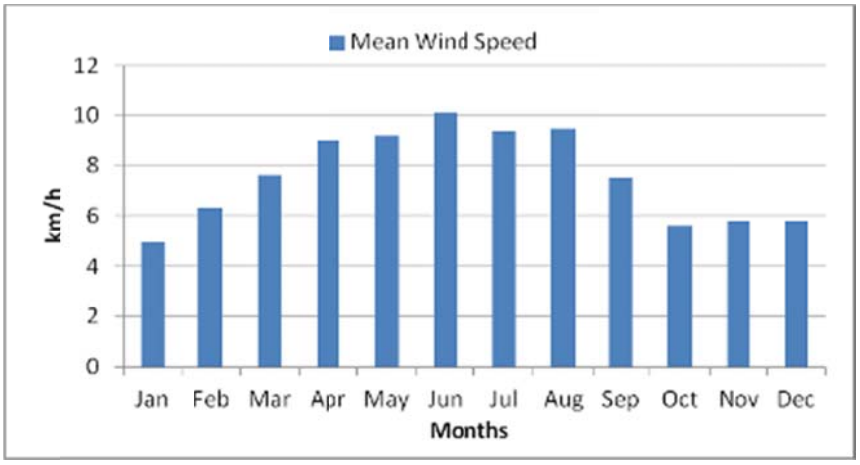


Figure 4-3: Variations in Mean Wind Speed

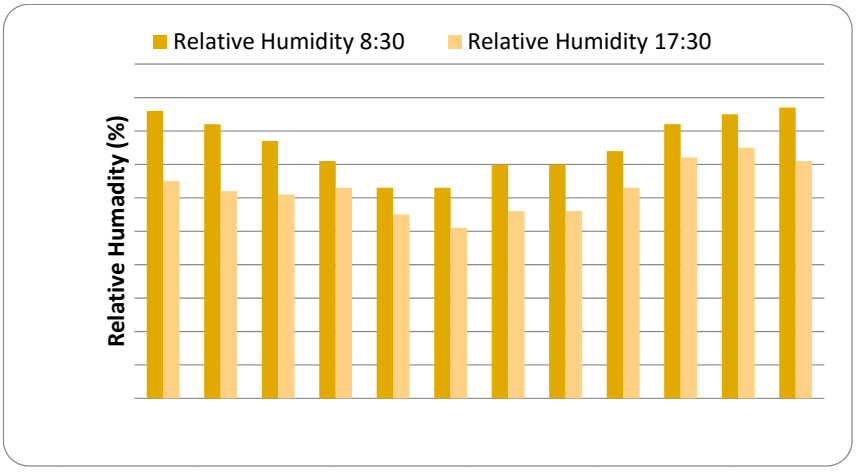
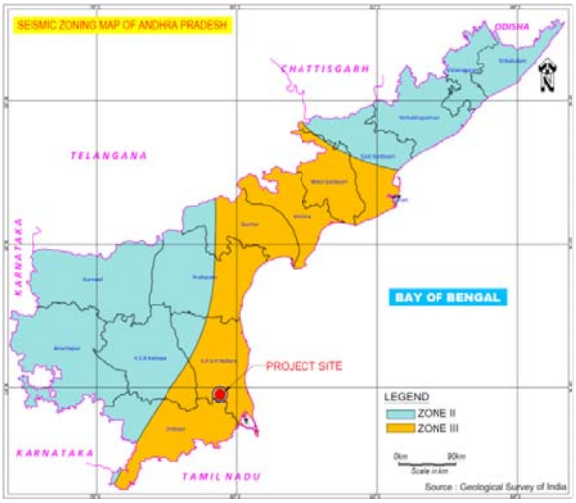


Figure 4-4: Variations in Relative Humidity

Seismic Zone Characteristics

As per the IS:1893 (Part 1) 2002 of Bureau of Indian Standards (BIS), the project location/study area falls in Zone III, which is categorised as a moderate risk zone. The seismic zoning map of Andhra region is shown in **Figure 4-5**.

Figure 4-5: Seismic Zoning Map



Cyclone

The coastal areas face the problem of cyclones almost every year. Near about 108 villages fall under the cyclone prone area, of which 65 villages are under marooned area and 43 villages are under inundation. According to government sources, there are 175 cyclone shelters established in Nellore District.

Reserved Forests

From discussions with the officials from Forest Block Office, Naidupeta, we understand that the Naidupeta Cluster abuts the Attivaram and Sangavaram Reserve Forests having Reserve Forest Block # 154 and 152 respectively. As per the information from Forest Department officials, these forest are territorial in nature and do not have any endangered species or animals of concern. Further the Industrial cluster is away from the RF block.

B. Socio-economic Profile of Naidupeta Cluster

Demographic Profile

Naidupeta Cluster falls under three mandals i.e., Naidupeta, Pellakur and Ojili Mandals comprising six (6) villages. As per Census 2011, the villages comprises of total population of 7234 persons with 1967 number of households. Total male population is 3655 persons and female population is 3579. This reveals that female population is less than males in the study area villages. Scheduled Caste and Scheduled Tribe population in the study area villages comprises of 2377 and 640 persons, which is 32.85 % and 8.84% of the total population.

Occupational Profile

The workforce population in the study area villages comprises of 3645 persons which is 50.38% of the total population. Male workforce comprises of 2185 persons whereas female workforce comprises of 1460 persons. 2966 persons come under the category of Main workers and 679 persons consist of Marginal workers. Around 3589 persons fall under the category of non-workers who are not engaged in any gainful employment activities. This shows that nearly half of the population forms the dependants' category in the study area villages which is thereby putting more burdens on the working population.

Literacy Rate

The study area villages have a population of 4155 persons as literates which is 57.43% of the total population. Male literacy rate is 57.08% and female literacy is 42.91% of the total literate population. This shows that the female literacy rate is less as compared to the male literacy rate in the study area. 3079 are illiterates in the study area with 1283 persons comprising of male illiterates and 1796 persons comprising of female illiterates

C. Baseline Environmental Conditions

For purpose of this Environmental and Social Screening report, baseline environmental data presented in the *EIA report prepared by M/s. Ramky Enviro Engineers Pvt. Limited for the Naidupeta SEZ project was referred.* ***The data presented in the following sections is reproduced from the Ramky EIA Report.***

The baseline environmental data was generated for monsoon, winter and summer seasons from September 2012 to May 2013. A map showing the monitoring locations is shown as **Figure 4-6**. Details of the monitoring/sampling locations are provided in **Table 7.**

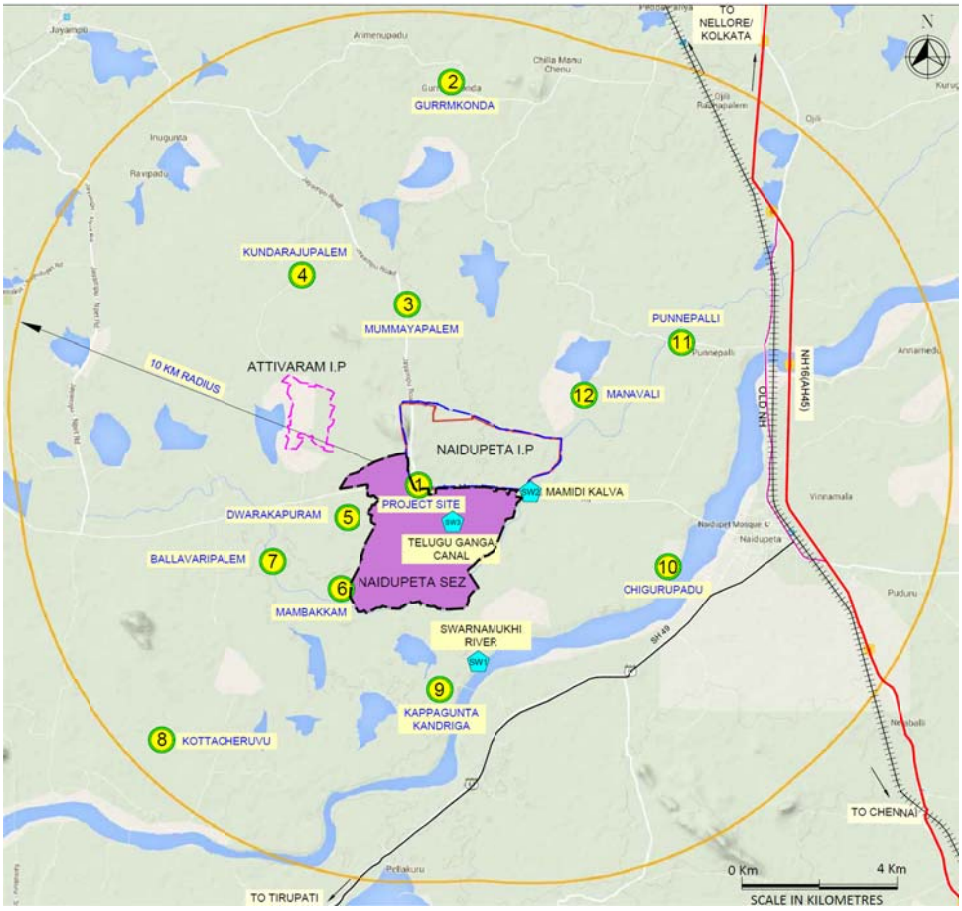


Figure 4-6 Monitoring Locations Map

Table 12: Monitoring Locations

Location	Name of the Station	w.r.t. site			Latitude (North)	Longitude (East)
		Direction	Wind	Distance (Km)		
1	Project site	-	-	-	13°55'9.76"	79°48'45.07"
2	Gurramkonda	N	Cross Wind	7.4	14°0'38.44"	79°49'11.31"
3	Mummayapalam	N	Cross Wind	6.2	13°57'34.81"	79°48'37.11"
4	Kundarajapalam	NW	Cross Wind	7.6	13°58'3.68"	79°47'8.09"
5	Dwarakapuram	NW	Cross Wind	3.0	13°54'42.76"	79°47'39.01"
6	Mambaku	SW	Down Wind	3.3	13°53'42.32"	79°47'41.10"
7	Bollavaripalam	SW	Down Wind	5.5	13°54'06.49"	79°46'42.53"
8	Kotta Cheruvu	SW	Down Wind	8.2	13°51'37.94"	79°45'4.64"
9	Kappagunta Kanariga	S	Cross Wind	3.9	13°52'19.19"	79°49'11.60"
10	Chigurupadu	E	Cross Wind	5.6	13°53'59.387"	79°52'18.3"
11	Punnepalli	NE	Up Wind	8.9	13°57'5.219"	79°52'28.59"

Location	Name of the Station	w.r.t. site			Latitude (North)	Longitude (East)
		Direction	Wind	Distance (Km)		
12	Manavali	NE	Up Wind	5.7	13°56'22.41"	79°51'9"
Surface Water Sampling Locations						
SW1	SW1	SW1	SW1	SW1	SW1	SW1
SW2	SW2	SW2	SW2	SW2	SW2	SW2
SW3	SW3	SW3	SW3	SW3	SW3	SW3

Ambient Air Quality

Existing levels and variations in ambient air quality is presented in **Figure 4-7** to **Figure 4-10**. Statistical parameters like minimum, maximum mean and 98th percentiles have been computed from the observed raw data for all sampling stations.

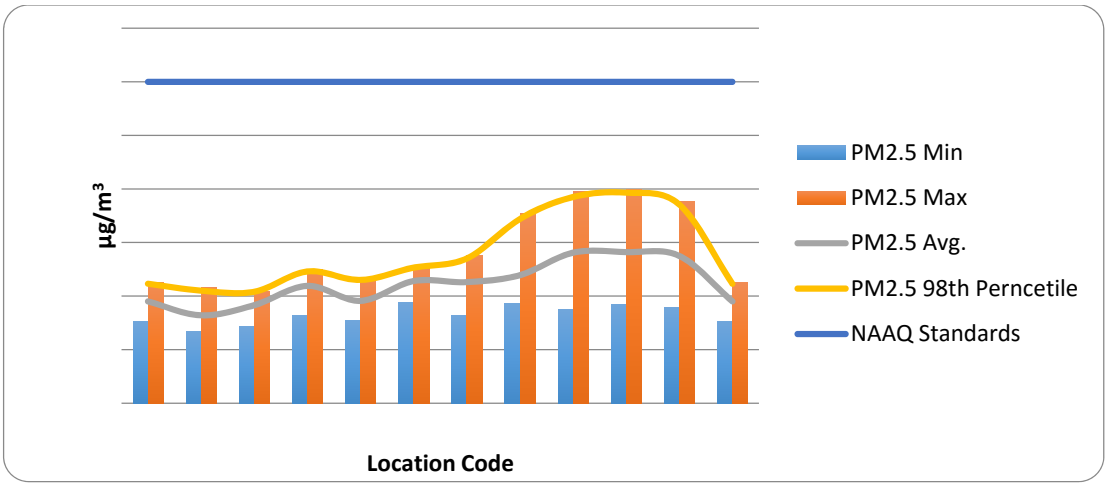


Figure 4-7: Ambient $PM_{2.5}$ Levels

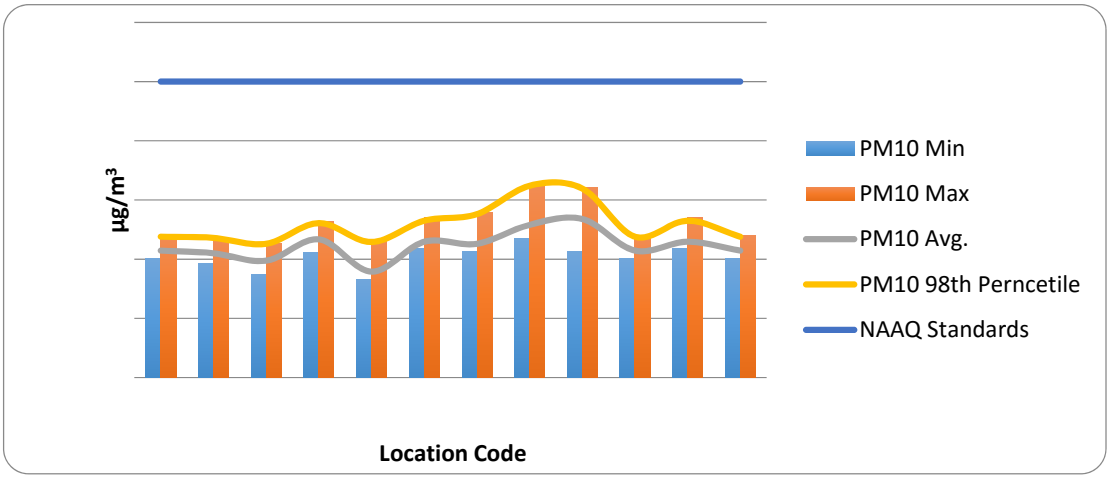


Figure 4-8: Ambient PM_{10} Levels

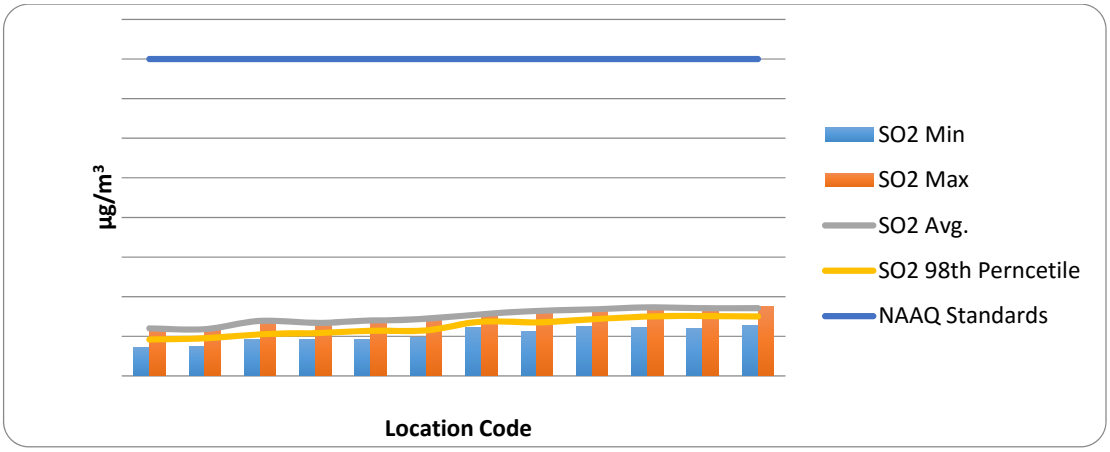


Figure 4-9: Ambient SO_2 Levels

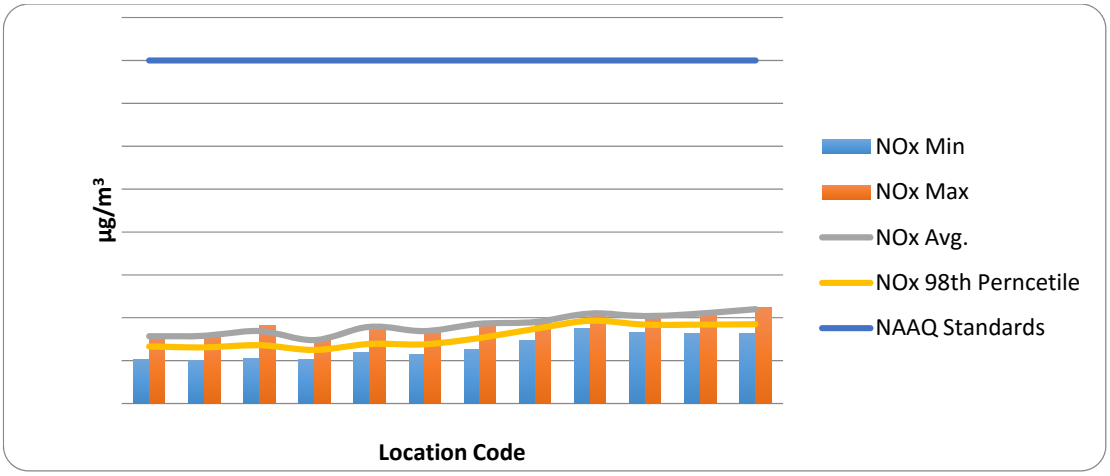


Figure 4-10: Ambient NO_x Levels

Baseline data when compared to existing National Ambient Air Quality Standards (NAAQS); were found to be within the applicable limits of the NAAQS.

Noise Environment

The baseline data reported that minimum and maximum noise levels for day equivalents (Ld) during study period ranged between 50.3 (at Location N2 – Gurramkonda) and 54.7 (at Project Site) dB(A), respectively. Minimum and maximum noise levels recorded at Project Site was 43.2 and 58.9 dB(A) respectively and Ld and Ln at the project site are 54.7 and 44.1 respectively. The summary of the results are presented in **Figure 4-11**.

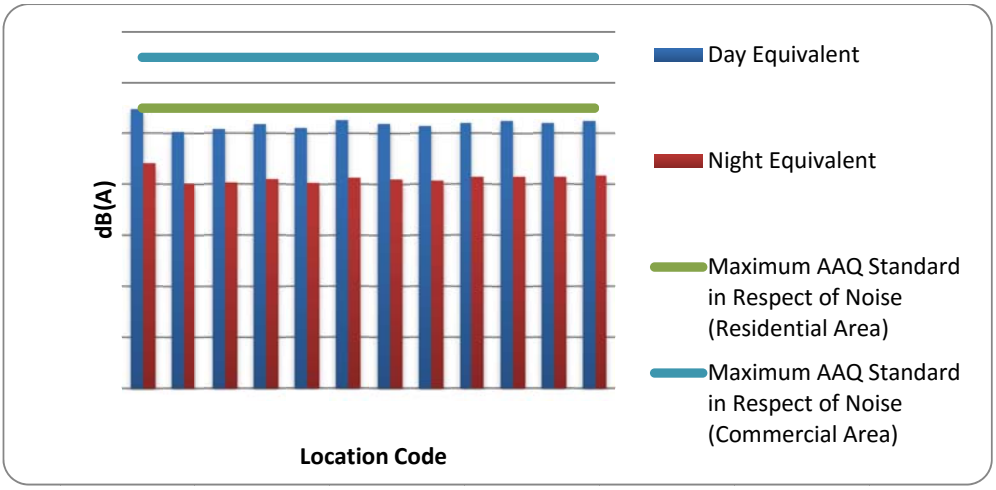


Figure 4-11: Noise Results

Source: EIA Report prepared by RAMKY

The recorded noise levels when compared to the prescribed standards (AAQ Standards in respect of Noise SO 123 (E), dated 14th February, 2000) was noted that all recorded noise levels were within the prescribed standards for Commercial Zones. The noise levels were also predominantly within standards for Residential Zones, barring few locations where the recorded levels were slightly exceeding the standards.

Soil Quality

- pH was reported to be varying from 6.90 to 8.50 indicating that the soils are falling in normal saline class
- The Electrical Conductivity varied from 42 to 307 µmhos/cm indicating that the soils are falling in the normal category
- Organic carbon varied from 0.15 to 1.01%

Water Quality

Principal River in the district is Pennar which flows in central part. Kandaleru, Swarnamukhii and Kalangi are in the south and Manneru is in the north. All these rivers are flowing from west to east and joining the Bay of Bengal. The Swarnamuki River is ~ 8 km East of the project site and the Bay of Bengal is ~ 38 km northeast. Currently, based on the initial screening, there does not appear to be a concern for water pollution at this moment.

Summary of the results of water quality analysis as reproduced from the RAMKY prepared EIA report is presented below:

Ground Water

- pH was varying for ground water from 6.79 to 8.41 indicating the results are within the limits for drinking water samples (i.e. 6.5 to 8.5).
- Total Dissolved Solids are varying from 408 mg/l to 1780 mg/l; results indicated that TDS levels are mostly above the acceptable limits (500 mg/l) but within permissible limits (2000 mg/l).
- Chloride levels were ranging from 92 mg/l to a maximum of 739 mg/l; results indicate that Chloride levels are mostly above the acceptable limits (250 mg/l) but within the permissible limits (1000 mg/l).

- Hardness is varying from 78 mg/l to 872 mg/l; results indicate that Hardness in 7 samples were below the acceptable limit (300 mg/l), one sample is having value above the acceptable limit but within the permissible limit (600 mg/l) and remaining 4 samples were above the permissible limit.
- Fluoride values were in the range of 0.47 mg/l to 0.98 mg/l; results show that the Fluoride levels in all samples were within the acceptable limit (1 mg/l).
- Surface Water
- pH was varying between 6.99 to 7.56 which are meeting the IS: 2296-1982 standard for inland surface water
- Total Dissolved Solids were in the range of 68 mg/l to 334 mg/l which were within the Class 'A' Standard of the inland surface water as per IS: 2296-1982
- Chlorides were in the range of 20 mg/l to 94 mg/l, which are meeting the Class 'A' Standards of the IS: 2296-1982 for inland surface water
- Hardness is varying between 29 mg/l to 58 mg/l which are meeting Class 'A' Standards as per IS: 2296-1982.
- Fluoride content is in the range of 0.48 mg/l to 0.67 mg/l, which were meeting the Class 'A' norms as per IS: 2296-1982.

Ecology

The initial reconnaissance survey suggests that the proposed location for development of the Naidupeta Cluster is predominantly barren land and devoid of large trees and mainly consists of scattered and sparse vegetation, i.e. *Prosopis juliflora,* a few scattered individuals of *Casuarina equisifoliata* and *Cocos nucifera.* Agricultural fields are also observed in the surrounding areas of the project site. As per the information from department, no rare or sensitive / endangered flora or fauna are reported in the project region. No records were found of rare or sensitive flora and fauna species in the study area.

Air Quality

The ambient air quality in the state is quite pure compared to other neighbouring states. Particulate emissions from industrial activities are major concern in the state. Dust arising from unpaved surfaces, forest fire, smoke created by burning of fire woods for producing charcoal and domestic heating, and vehicular pollution are other possible secondary sources of pollution in the state. Firewood burning is major contributor in the ambient pollution load. Industrial & vehicular pollution is mainly concentrated in the major commercial areas in the State. Lack of technology and state of the art equipment are some of the factors responsible for industrial pollution.

Pollution from vehicles is mainly due to use of low-grade fuel, low maintenance of vehicles, and also the poor conditions of the roads. The level of pollution in rural areas is much lower than that of the urban areas. The air quality is reported within permissible limits in these areas.

ADB SPS requires that the subproject applies pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as World Bank Group’s EHS Guidelines. Table 12 provides the WHO ambient air quality guidelines.

Table 13: WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Noise Quality

Noise pollution is not a problem in the state. Also in future there will not be any rise in the noise levels due to proposed activities. At busy junction small contribution to the noise levels are expected, but still the ambient noise quality is expected to be well within the permissible limits.

During the construction period, temporary increase in the noise levels are expected due to movement of construction machineries and construction activities associated with proposed road development. Suitable barriers in the form of noise barriers and timely scheduling of construction activities will minimize these affects to the greater extent.

ADB SPS requires that the subproject applies pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as World Bank Group's EHS Guidelines. Table 14 provides the noise level guidelines.

Table 14: World Bank Group's EHS Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines[54]		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

Augmentation of Industrial Infrastructure projects are likely to bring changes in the local environment both beneficial and adverse. Scoping process was undertaken to identify potentially significant impacts for the proposed utility infrastructure enhancement subprojects. Potential impacts in absence of additional mitigation measures were also identified. There were no potentially significant impacts requiring further assessment identified for the subproject. Detailed assessment for the subprojects have already been conducted as a part of the EIA studies for Naidupeta industrial cluster.

This section of IEE identifies nature, extent, and magnitude of likely changes vis-a-vis project activities for all stage of project cycle i.e. preconstruction, construction, and operation. Beneficial impacts are mostly long-term and permanent whereas adverse impacts are localized and temporary in nature and are likely to occur mostly during construction stage.

A. Beneficial Impacts

The immediate benefits of the proposed subproject come in the form of direct employment opportunities during construction and operation of the internal utilities for those engaged as wage laborers, contractors and suppliers of raw materials.

Augmentation of internal utilities subproject will result in effective enhancement and connectivity of internal road network, storm water management through provision of drains, enhanced water supply network for the industrial cluster, enhanced and reliability of power supply through increased power distribution network and enhanced management and conservation of water. This will help in attracting different sectors of industries to the industrial estate due to availability of adequate infrastructure ensuring environmental compliance and increased employment opportunities for people. The influx of industrial sectors such as petrochemical, pharmaceutical, textiles, etc. will also help in overall economic development of the state, resulting in attracting skilled workforce and enable improvement of quality of life of people.

The long-term effects of these developed industrial clusters on poverty reduction are, consequently, expected to be significantly positive.

During operation stage, economic activities supporting ancillary industries, trade, transport, etc. will increase due to increase in industrial activities is also expected to improve development of urban centers with amenities like housing, educational institutions, hospitals, etc.

B. Adverse Impacts

Any developmental activity in its wake will bring about some adverse impacts associated with its activities. For a Industrial Cluster based on the possible worst case emissions and waste generation scenario, prediction of impacts helps in the preparation of a sound environmental management plan which has to be executed during the on-going activities for the proposed project to minimize the adverse impacts on the environmental quality. Provision of effective connectivity through internal transport and efficient management of industrial cluster operations will be important to manage any adverse impacts due to sub-project operations.

C. Potential Impacts during Construction Phase:

1. Impact on Air Quality

The proposed subprojects will require some construction during the development phase. Air quality in the immediate vicinity is likely to be marginally affected due to movement of vehicles and heavy earth movement works that will be undertaken as part of subproject works. In most instances the primary concern during construction phase are emissions of dust and particulate matter that arise from the movement and storage of materials and other construction activities. The emissions from vehicles and construction machinery is also considered.

For all developments, best practicable means should be adopted to control and reduce emissions. Some examples that may be used are as follows:

(i) Use of enclosures – use of screens and sheeting to contain dust;
(ii) Use of paved / surfaced and cleaned haul routes and hard-standings;
(iii) Use of water suppression and wheel washing;
(iv) Choice of location and facilities for site storage where required (aggregates, sand, soil, cement etc.);
(v) Location of dust generating activities e.g. stone / flag cutting; (vi) Transport route selection and location; and (vii) No burning on site.

2. Potential Impact on Water

During the construction phase water will be used for varies construction activities. To fulfill the water requirement, water is to be supplied from the nearest surface water bodies from the water reserves in the area.

Mitigation Measures

(i) During the pre and post construction, the following measures has to be followed to maintain the quality of ground and surface water:
(ii) Preventing the run-off water beyond the Industrial cluster premises so that it will recharge the ground water in the same area; and Storm water drainage system should be provided inside the project area.
(iii) ground water should be minimized for construction activities and water or surface water wastage should be avoided.

3. Impact on noise levels

Sources of noise pollution during the construction of the subprojects is from machinery comprising of mainly bull dozers, front end loaders, standby generators, fabrication workshop and other heavy earth machinery used in construction in addition to the vehicular movement within the project boundary. The industrial estates of Naidupeta are far from the main city population and as such impact of noise on the surrounding areas will be minimal.

4. Impact on the existing traffic system

The proposed subprojects will involve minimal and temporary increase in traffic for transportation of the construction material.

5. Impact on Topography and land use

The industrial estates are located on barren land and the subproject implementation will have no or minimal impact on present topography as well as land use.

6. Impact on soil quality

Land disturbance from the proposed construction activities will be confined to the immediate work area. It is anticipated that major civil and mechanical works would be undertaken in setting up the subprojects. Overall the impact of this on the site environment will be temporary.

7. Impact on ecology

The proposed subprojects are a part of Naidupeta Cluster that is barren land and there are no rare or sensitive flora and fauna species in site or in the region, it is predicted that the impacts on existing flora and fauna will be negligible. Further, development of green belt around the subproject area would enhance the situation by planting local fast growing species which are present in the surrounding areas.

(i) **Impact on Land and Private Properties:** The industrial estate land is already acquired by APIIC and subprojects will be placed in the industrial estate only. No new land acquisition is required for the subprojects or for the water supply pipeline.
(ii) **Impact on historical monuments / religious structures:** There are no adverse impacts expected on historical places/monuments.

Borrow Areas and Quarries: Need for opening borrows areas and quarries are not anticipated. However, if requirement emerged, it may cause some adverse impacts if left un-rehabilitated. It may pose risk to people, particularly children and animals of accidentally falling into it as well as become potential breeding ground for mosquitoes and vector born disease. Illegal quarrying may lead to unstable soil condition; destroy the landscape of the terrain, air and noise pollution. Opening of new quarries is not envisaged due to the proposed subproject. Quarry material will be sourced from existing licensed quarries.

D. Potential Impacts during operation phase

The potential significant environmental impacts associated with the project during the operation phase are discussed below.

1. Impact on Air Quality

The possible air emissions from subprojects operations include vehicular air pollution and emissions from diesel generator sets.

Mitigation Measures:
(i) Regular ambient air monitoring will be conducted and devices will be installed to regularly monitor and report any aberrations.
(ii) Adequate PPE's will be provided to people working in the vicinity of these areas.

2. Impact on Occupational health

The construction related occupational health and safety impacts may be significant particularly for personnel working on pipeline laying, power distribution network and road construction. Regular rotation of employees conducting similar different tasks and efficient use of PPE's will help reduce the impact.

Mitigation Measures:
(i) Where, gases or fumes are likely to be present in trenches / foundations, sufficient mechanical/artificial ventilation will be provided to protect the health and safety of the workers.

(ii) Care will be taken to avoid all sources of ignition at the places of flammable material storage areas through erection / display of appropriate sign boards.
(iii) Adequate PPE's will be provided to people working in the vicinity of these areas.
(iv) Personal Protection Equipment such as earmuffs, protective clothing, helmets, goggles, shoes, gloves, etc. to the operation personnel involved in pile driving operations will be provided.

3. Impacts due to Hazardous waste

The handling of hazardous waste generated during construction, transportation and storage of raw materials are the activities that are likely to have an impact on land pollution and air and water pollution. It is important that hazardous waste management practices are adequately framed and implemented to avoid such situations. This impact may be significant from regulatory requirements and also due to impacts on people and environment due to improper hazardous waste management practices.

Mitigation Measures:

(i) The hazardous waste needs to be identified, stored and managed by implementation of required work instructions, following of material safety data sheet precautions, provision of suitable measures to prevent leakage and emissions of hazardous materials.
(ii) Monitoring devices will be installed to regularly monitor and check any leakages.
(iii) Adequate PPE's will be provided to people working in the vicinity of these areas.

E. Solid Waste Management

1. Sludge from subproject construction sites

The solid waste from subprojects comprises of construction debris, bitumen waste, oil soaked soil and cotton waste, empty oil and other hazardous waste materials. The solid waste may be used filling purposes and brick manufacturing and sold to brick manufacturer.

2**. Unanticipated Impacts during Construction and Operation**

In the event, unanticipated impacts become apparent during project implementation, the borrower will: (i) inform and seek ADB's advice; (ii) assess the significance of such unanticipated impacts; (iii) evaluate the options available to address them; and (iv) update the IEE including EMP. ADB will help the borrower mobilize the resources required to mitigate any adverse unanticipated impacts or damage.
Indirect, Induced and Cumulative Impacts: The proposed works in the industrial estate will be the main generator of indirect and induced impacts. The volume of vehicle movements that will be generated and the likely closure/blocking of some roads/lanes during construction will cause traffic build-up and choke points. Apart from the applicable mitigation measures for direct impacts during construction, the coordination with the relevant community and village authorities, social service institutions and business associations should enable further mitigation of indirect and induced the impacts.

As such, the proposed industrial estate works will not generate cumulative impacts of high magnitude and significance in terms of dust, noise, water resources contamination, soil contamination, traffic, blocking of accesses, health and safety hazards and disruption to social services and economic activities. The grievance redress mechanism will be disclosed (through public meetings, display at strategic places and media) to the communities affected by the cumulative impacts.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Public Consultation and Information Disclosure

Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy. A consultation and participation strategy is being designed and will be implemented with the assistance of consultants. By addressing stakeholder needs, there is greater awareness of the benefits and "ownership" of the project among stakeholders, which in turn contribute to sustainability. The consultation process during the project preparation has solicited inputs from a wide range of stakeholders, including government officials, NGOs, residents near the subproject locations and towns, marginalized/vulnerable beneficiary groups, and project-affected persons (APs).

Consultation, participation, and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the subproject preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected people can be adequately considered, and continue at each stage of the subproject preparation, processing, and implementation.

APs were consulted in the preliminary stage and subsequently to ensure: (i) incorporation of their views/concerns on compensation/resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable groups in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and APs in the project process.

Relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

A variety of approaches were adopted such as stakeholder consultations regarding the scope of the environmental and social impact studies before work commences, and they were informed of the likely impacts of the project and proposed mitigation once the draft EIA/IEE and resettlement plan reports were prepared. The views of different stakeholders were recorded and documented and indicate how these have been taken into account in project development.

The key stakeholders consulted during project preparation included:

(i) Project beneficiaries;
(ii) Andhra Pradesh Industrial Association (s)
(iii) Elected representatives, community leaders, religious leaders, and representatives of community-based organizations;
(iv) local NGOs;
(v) Andhra Pradesh Pollution Control Board
(vi) local government and relevant government agency representatives, including local authorities responsible for land acquisition, protection, and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;
(vii) residents, shopkeepers, and business people who live and work alongside the industrial estates where facilities will be built;
(viii) Custodians, and users of socially and culturally important buildings;
(ix) VCICDP PMU and consultants; and
(x) ADB, Government of Andhra Pradesh and the Government of India

Detailed consultations and public hearing in the presence of District Collector were conducted as per the Environmental Clearance requirements. Details are available in the EIA reports of Naidupeta industrial estates.

Table 15 : Details of Public Hearing and Stakeholder Consultation Meeting held on 28.07.2015 for Naidupet Economic Zone

Sl. No.	Name	Representative Section	Issue discussed	Date
1.	N Krishnaiah	R/O Menakur Village	Waste Water Discharge and water pollution due to industries operating in the region.	28-7-2015
2.	Sri Rajendra	R/O Menakur Village	Payment of taxes to panchayats	28-7-2015
3.	Sri L Chenchu Babu	R/O Menakur Village	Allocation of sufficient funds under CSR for environmental water pollution control. Formation of a committee for overseeing implementation.	28-7-2015
4.	Dr. R Krishnaiah	Political P Representative, Naidupet		28-7-2015
5.	A Madhusudan Rao	R/O Menakur Village	Effective pollution control measures for preventing health risks such as asthma, etc.	28-7-2015
6.	Muppala Paradhamraju	R/O Konetupa village, ward member	Loss of grazing land due to industrial activity	28-7-2015
7.	Sri V Sunanda Reddy	NGO Representative, Nalgonda	Emphasized need for ground water harvesting and development of a green belt.	28-7-2015
8.	Sri Putta Krishna	R/O Menakur Village	Adequate compensation to be paid	28-7-2015
9.	Smt. S Navaneethamma	R/O Menakur Village	Adequate compensation to be paid	28-7-2015
10.	Sri Suresh	R/O Menakur Village	Village road widening for safety	28-7-2015
11.	Sri K Sudhakar Reddy	R/O Menakur Village	Adequate water storage, green belt development and adequate medical facilities	28-7-2015
12.	Sri Pothurasi Subramanyam	R/O Menakur Village	Occupational health and safety and adequate provision of PPE's	28-7-2015

B. Future Consultation

This process shall be extended during implementation. Appointed PMSC (Project Management and Supervision Consultant) agency and APIIC Environment and Social Safeguards officer shall develop public consultation and disclosure program which is likely to include (i) Public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started; and (ii) smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation.

C. Information Disclosure

The EIA report for Naidupeta industrial estate including the subproject component will be disclosed after environmental clearance from the ministry of environment and forests is obtained. Naidupeta industrial estate draft report including the subproject component has been disclosed for comments and public hearing for IP Naidupeta was held on 20th September 2016 and EIA / EMP reports will be submitted to MoEF shorlty . Further MPSEZ has received the Environmental clearance and whereas for IP Attivaram Environmental Clearance is awaited. . Information is disclosed through public consultation and making relevant documents available in public locations. The following documents will be submitted to ADB for disclosure on its website:

(i) final IEE;
(ii) a new or updated IEE and corrective action plan prepared during project implementation, if any; and
(iii) environmental monitoring reports.

VCICDP PMU will send written endorsement to ADB for disclosing these documents on ADB's website. VCICDP PMU will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

D. Grievance Redress Mechanism

Common Grievance Redress Mechanism. Project grievance redress mechanism will be established to evaluate, and facilitate the resolution of APs' concerns, complaints, and grievances related to social and environmental issues of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

A common GRM will be in place for social, environmental, or any other grievances related to the project. Every grievance shall be registered and careful documentation of process with regard to each grievance undertaken, as explained below. The APIIC environmental and social safeguards officers will have the overall responsibility for timely grievance redress on environmental and social safeguards issues, including keeping and maintaining the complaint and redress records. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated.

Affected persons will have the flexibility of conveying grievances/suggestions by sending grievance redress/suggestion in writing, through telephone call to APIIC safeguards officer or by filling forms for complaints/suggestion by email in the VCICDP Project site to be installed under the APIIC websites. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The APIIC's safeguard officers will

have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party.

Grievance Redressal Committee. Grievance Redressal Committee (GRC) will be established at two-levels, one at APIIC level and another at PMU level, to receive, evaluate and facilitate the resolution of displaced persons concerns, complaints and grievances. The GRC will provide an opportunity to the APs to have their grievances redressed prior to approaching the jurisdictional sub court. The GRC is aimed to provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address affected person's concerns without allowing it to escalate resulting in delays in project implementation.

The GRC will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The GRC is not intended to bypass the government's inbuilt redressal process, nor the provisions of the statute, but rather it is intended to address displaced persons concerns and complaints promptly, making it readily accessible to all segments of the displaced persons and is scaled to the risks and impacts of the project.

The APIIC level GRCs will function out of each District where the subproject is being implemented. The GRC will be Chaired by Joint Collector and comprising of the Divisional Engineer acting as its member secretary and the following members: (i) RDO/Sub Collector of the division; (ii) Project Director, DRDA; (iii) Chief Executive Officer, Zilla Parishad; (iv) District Panchayat Officer; (v) District Education Officer; (vi) District Medical and Health Officer; (vii) District Level representative of DISCOM; and (viii) Superintendent, RWS Panchayat Raj Department.

The Project Director, PMU will be the appellate authority who will be supported by the PMSC and Safeguard Officer of PMU, and APIIC to make final decisions on the unresolved issues.

Grievance redresses process. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and PMSC on-site personnel will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned APIIC safeguard officers and contractors will be posted at all construction sites at visible locations. The APIIC safeguard officers will be responsible to see through the process of redressal of each grievance.

(i) **1st Level Grievance.** The phone number of the APIIC office should be made available at the construction site signboards. The contractors engineer and APIIC safeguard officers can immediately resolve on-site in consultation with each other, and will be required to do so within 7 days of receipt of a complaint/grievance.

(ii) **2nd Level Grievance.** All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the APIIC level grievance redress committee (GRC) with support from APIIC safeguard officers and PMSC environment and resettlement specialists. APIIC level GRC will attempt to resolve them within 15 days.

(iii) **3rd Level Grievance.**The APIIC safeguards officers will refer any unresolved or major issues to the PMU/State-level GRC, who in consultation with APIIC will resolve them within 15 days.

Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB India Resident Mission (INRM). The complaint can be submitted in any of the official languages of ADB's developing member countries. The

ADB Accountability Mechanism information will be included in the project-relevant information to be distributed to the affected communities, as part of the project GRM.

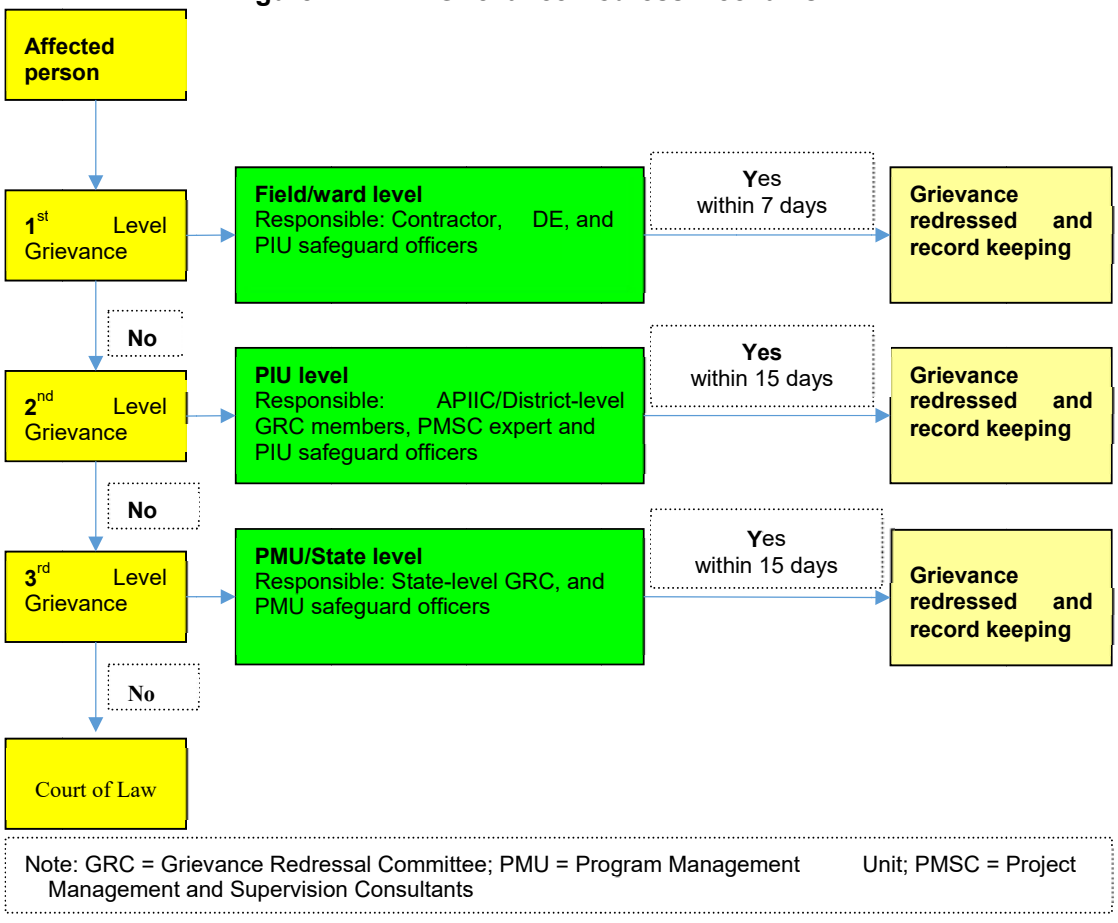
Record keeping. Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions the date by these were effected and final outcome will be kept by PMU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, and on the web, as well as reported in the semi-annual social and environmental monitoring reports to be submitted to ADB.

Periodic review and documentation of lessons learned. The PMU, and APIIC supported by the PMSC specialist will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the APIIC's ability to prevent and address grievances.

Costs. All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by APIIC; while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

The grievance redress process is shown in Figure 7 below.

Figure 7: APIIC Grievance Redress Mechanism



The GRCs will continue to function throughout the project duration.

VII. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

DOI will be the executing agency. A PMU established within the Directorate of Industries, which is under the DOI is responsible for planning, implementation, monitoring and supervision, and coordination for subproject under VCICDP. APIIC will be responsible for implementing the subproject. PMU will recruit PMSC to provide support in implementation of VCICDP.

PMU will support APIIC in implementation, management and monitoring of the project. PMU and APIIC will be assisted by PMSC respectively. APIIC will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, the APIIC will operate and maintain the infrastructure. At state-level a Project Steering Committee (PSC) will be established to provide overall policy direction for the implementation of VCICDP.

A. Safeguard Implementation Arrangement

Project Management Unit. The PMU structure is as provided in the Table below. PMU will be supported by PSMC. PMU will appoint a safeguards coordinator as a part of the PMSC team to collect information and progress on environmental and social safeguards compliance.

Table 16: Tentative PMU Structure

Position	Tasks
Project Director	Overall Project Management
Project Director (Department of Industries)	Management of land-related issues
Procurement Officer	Procurement of consultants, civil works, goods, and NGOs, etc.
PMSC (Senior Engineer)	Technical officer with engineering background and preferably experience of multilateral projects
Institutional Coordination and Policy Reforms officer	Policy and Institutional support
Investment Promotion Officer	Coordination of VCICDP promotion, marketing
Monitoring and Evaluation Officer	Monitoring project results
PMSC (Environmental Safeguards Officer)	Environmental safeguards compliance
PMSC (Social Safeguards and Gender Officer)	Resettlement compliance, social, gender
Chief Accountant and Financial Management Officer	Project accounting, audit and reporting
Accountant	Accounting
Office Manager	Office management

Key tasks and responsibilities of the PMU environmental safeguards officer are as follows:

(i) confirm existing IEEs/EMPs are updated based on detailed designs and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
(ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
(iii) provide oversight on environmental management aspects of subprojects;
(iv) ensure SEMPs prepared by contractors are cleared by APIICs prior to commencement of civil works;
(v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the SEMPs;
(vi) facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (e.g., Location Clearance Certificates, Environmental Clearance Certificates etc.), as relevant;

(vii) supervise and provide guidance to the APIIC to properly carry out the environmental monitoring and assessments as per the EARF;
(viii) review, monitor and evaluate the effectiveness with which the SEMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
(ix) consolidate monthly environmental monitoring reports from APIIC and submit semi-annual monitoring reports to ADB;
(x) ensure timely disclosure of final IEEs/SEMPs in locations and in a form and language accessible to the public and local communities; and
(xi) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner.

APIIC: In APIIC, the Senior Engineer will be deputed/designated as Environmental Safeguard Officer in addition to the environmental engineer.

Table 17: APIIC Environmental Safeguard Officer Tasks and Responsibilities

APIIC Environmental Safeguard Officer	Tasks and Responsibilities
Senior Engineer Cum Compliance Officer – APIIC	(i) include IEEs/EMPs in bidding documents and civil works contracts; (ii) review and approve SEMPs prepared by contractors; (iii) oversee day-to-day implementation of SEMPs by contractors including compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; (vi) take corrective actions when necessary; (vii) submit monthly environmental monitoring reports to PMU; (viii) conduct continuous public outreach and awareness building related to environmental management; (ix) address grievances brought about through the GRM in a timely manner; and (x) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants
	(i) Ensure complete payment and other resettlement assistants provided to the affected people prior to displacements (physical and economical) and starts of civil works in the affected areas; (ii) Coordinate with Safeguard Manager of PMU and ensure all social/environmental requirements if any are met.

Project Management and Supervision Consultants. The PMU and APIIC will be assisted by PMSC which will be staffed with environmental and social safeguard specialists to provide required assistance and regular progress report on safeguards implementation. The environmental specialist will have overall responsibility in implementation of environmental safeguards, including appropriate monitoring and reporting responsibilities. Key tasks and responsibilities of the PSMC environmental specialists are as follows:
(i) Update the IEEs including site- and subproject-specific EMP;
(ii) Supervise EMP implementation;
(iii) Prepare a monitoring report of final site- and subproject-specific EMPs and communicate with the stakeholders, including ADB on the progress, of the subprojects including environmental safeguards compliance; and
(iv) Prepare semi-annual environmental safeguards compliance reports.
(v) Establish a system to monitor environmental safeguards of the Project; prepare indicators for monitoring important parameters of safeguards;
(vi) Ensure all requisite approvals and no objection certificates are in place to allow implementation, and that these are renewed in a timely manner where required;

(vii) Ensure that provisions and conditions of all necessary permits, consents, NOCs, etc., are incorporated in the IEEs;
(viii) Take proactive action to anticipate the potential environmental impacts of the Project to avoid delays in implementation;
(ix) Assist APIIC in the establishment of GRC for IEE implementation;
(x) Support the APIICs and PMU in the GRM implementation to address any grievances submitted in a timely manner and establish record keeping system for complaint and redressal status of the project;
(xi) Assist APIIC and PMU in the project GRM mechanism and complaint solution;
(xii) Assist APIIC and PMU for GRM record keeping for first tier complaint and redressed actions;
(xiii) Ensure that the relevant environmental mitigation measures specified in the updated EMP will be incorporated into bidding documents and approved by the ADB prior to the issuance of the invitation for bidding;
(xiv) Closely monitor and supervise to ensure that all mitigation measures and monitoring requirements set out in the EMP are implemented and complied with throughout the project implementation, and when required, prepare or recommend necessary corrective actions to be taken and monitor its implementation;
(xv) Provide on-the-job training programs to APIIC staff involved in Project implementation for strengthening their capacity in managing and monitoring environmental safeguards; and
(xvi) Assist the APIIC safeguards officer to sensitize the turnkey contractors on ADB SPS, EARF, and GRM during detailed design and civil works implementation.

Civil works contracts and contractors. EMPs are to be included in bidding and contract documents and verified by the APIIC and PMU. The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract.

The APIIC and PMU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

Table 18: Institutional Roles & Responsibility: Environmental Safeguards

Phase	PMU / APIIC	PMSC	ADB
Appraisal stage of all Subprojects under the investment program	PMU / APIICs to review the REA checklists and draft EIA/IEE. PMU / APIICs to submit draft EIA/IEE to ADB for review and approval. PMU / APIICs to disclose on its website the approved EIA/IEE. PMU / APIICs to ensure disclosure of information throughout the duration of the subproject.	PMSC to conduct REA for each subproject using checklists and to prepare EIA/IEE	ADB to review the REA checklists and reconfirm the categorization. ADB will review and approve EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website the submitted EIA/IEE report.

Detailed Design Phase of all Subprojects under the investment program	PMU / APIICs with the assistance of PMSC to incorporate the EMP, environmental mitigation and monitoring measures into contract documents. PMU / APIICs to obtain all applicable consents/permits/clearances PMU to submit to ADB final IEE for approval and disclosure at ADB website.	PMSC to revise the IEE and EMP in accordance with detailed design changes if warranted. PMSC to ensure incorporation of EMP in bid documents and contracts. PMSC to prepare inventory of utilities to be affected by the subproject.	ADB will review and approve updated EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website updated EIA/IEE report.
Pre-construction Phase of all Subprojects under the investment program	PMU / APIICs to conduct public consultation and disclosure during IEE process and comments will be reflected in the IEE report. PMU / APIIC to monitor the disclosure and public consultation. APIIC and PMSC to approve contractor‘s proposed locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes. PMU to submit to ADB in prescribed format semi-annual Environment Monitoring Report 6 months after Loan effective date.	PMSC to ensure statutory clearances and permits from government agencies/other entities are obtained prior to start of civil works. PMSC to ensure disclosure of information prior to start of civil works and throughout the duration of the construction period. PMSC to approve contractor‘s site-specific environmental plan (such as traffic management plan, waste management plan, locations for camp sites, storage areas, lay down areas, and other sites/plans specified in the EMP). PMSC to conduct baseline environmental conditions and inventory of affected trees	
Construction Phase of all Subprojects under the investment program	PMU / APIICs will review 6monthly monitoring and EMP implementation report including the status of Project compliance with statutory clearances and with relevant loan covenants and submit the 6-monthly report to ADB and seek permission to disclose the same in the investment program web site.	PMSC to monitor the implementation of mitigation measures by Contractor. PMSC to prepare monthly progress reports including a section on implementation of the mitigation measures (application of EMP and monitoring plan) PMSC (as per EMP) will conduct environmental quality monitoring during construction stage (ambient air and noise, and water quality). PMSC to prepare the sixmonthly monitoring report on environment by focusing on the progress in implementation of the EMP and issues encountered and measures adopted, follow-up actions required, if any.	ADB to review the 6 monthly report, provide necessary advice if needed to the PMU and approve the same. ADB to disclose on its website environmental monitoring reports.

Phase	PMU / APIIC	PMSC	ADB
Pre-operation Phase (Commissioning and Defect Liability Period)	PMU / APIICs to review monitoring report of PMSC on post-construction activities by the contractors as specified in the EMP PMU / APIIC to review applicable consents requirements	PMSC to apply for the CTOs prior to commissioning. PMSC to monitor and approve pos construction activities by the contractors as specified in the EMP.	
Operation Phase of all Subprojects under the **investment program**	APIICs to conduct monitoring, as specified in the environmental monitoring plan. APPCB to monitor the compliance of the standards regarding drinking water quality, ground water, ambient air, effluent quality from treatment plant, noise, as applicable.		

Notes: APPCB = Andhra Pradesh State Pollution Control Board, PMSC = Project Management Consultants, CTE = Consent to Establish, CTO = Consent to Operate, PMSC = Design and Supervision Consultant, EIA = Environmental Impact Assessment, EMP = Environmental Management Plan, IEE = Initial Environmental Examination, PMU = Project Management Unit; APIIC = Project Implementation Unit; REA = Rapid Environmental Assessment

VIII. INSTITUTIONAL CAPACITY AND DEVELOPMENT

The PMSC environmental safeguards specialist will be responsible for training PMU and APIIC on environmental awareness and management in accordance with both ADB and government requirements. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in Table 12.

Table 19: Training Program for Environmental Management

Description	Contents	Schedule	Participants
Pre-construction stage			
Orientation workshop	Module 1 – Orientation ADB Safeguard Policy Statement Government of India Environmental Laws and Regulations	1/2 day (at Vijayawada (50 persons)	PMU, and APIIC's officials involved in project implementation
Description	**Contents**	**Schedule**	**Participants**
	Module 2 – Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements - Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts	1/2 day (at Vijayawada) (50 persons)	PMU, and APIIC's officials involved in project implementation.
Construction stage			
Orientation program/ workshop for contractors and supervisory staff	Roles and responsibilities of officials/contractors/consultants towards protection of environment - Environmental issues during construction Implementation of EMP Monitoring of EMP implementation Reporting requirements	1 day (at Subproject locations) (15 persons)	PMU APIICs Contractors
Experiences and best practices sharing	Experiences on EMP implementation – issues and challenges Best practices followed	1 day on a regular period to be determined by PMU, APIICs, and PMSC (at Hyderabad / Naidupeta) (50 persons)	PMU APIICs Contractors

ADB = Asian Development Bank; EMP = Environmental Management Plan; APIIC = Project Implementation Unit;
PMU = Project Management Unit; PMSC = Design and Supervision Consultant;; APIIC= Andhra Pradesh Industrial & Infrastructure Corporation

IX. ENVIRONMENTAL MANAGEMENT PLAN , MONTORING PLAN

A. Environment Management Plan

Environmental Management Plan (EMP) is intended to set out clearly and unambiguously the likely negative impacts of construction and/or operation of the project, the action that is required to avoid or mitigate each impact and the responsibility for taking each action. Responsibility is made legally binding when actions are subsequently specified in contracts. The EMP (**Appendix 6)** also ensures that the positive impacts are conserved and enhanced. It addition, it provides measures for institutional strengthening and effectiveness assessment through defined monitoring plan, reporting and corrective & preventive action planning. More specifically the objectives of the EMP are:

(i) To ensure compliance with Asian Development Bank's applicable safeguard policies, and regulatory requirements of Andhra Pradesh and the Government of India;
(ii) To formulate avoidance, mitigation and compensation measures for anticipated adverse environmental impacts during construction and maintenance and ensure that environmentally sound, sustainable and good practices are adopted;
(iii) To stipulate monitoring and institutional requirements for ensuring safeguard compliance; and
(iv) The subprojects should be environmentally sustainable.

B. Environment Monitoring Program

The monitoring and evaluation are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to plan or not. It provides the necessary feedback for project management to ensure project objectives are met and on schedule. The reporting system is based on accountability to ensure that the environmental mitigation measures are implemented. Environmental monitoring program has the underlying objective to ensure that the intended environmental mitigations are realized and these results in desired benefits to the target population causing minimal deterioration to the environmental parameters. Such program targets proper implementation of the EMP. The broad objectives are:

(i) To evaluate the performance of mitigation measures proposed in the EMP.
(ii) To evaluate the adequacy of environmental assessment.
(iii) To suggest ongoing improvements in management plan based on the monitoring and to devise fresh monitoring on the basis of the improved EMP.
(iv) To enhance environmental quality through proper implementation of suggested mitigation measures.
(v) To meet the requirements of the existing environmental regulatory framework and community obligations.

C. Performance Indicators

The significant physical, biological and social components affecting the environment at critical locations serve as wider/overall Performance Indicators. However, the following specific environmental parameters can be quantitatively measured and compared over a period of time and are, therefore, selected as specific Performance Indicators (PIs) for monitoring because of their regulatory importance and the availability of standardized procedures and relevant expertise. A comprehensive monitoring plan for all performance indicators has been prepared for all stages appended as **Appendix 7.** This includes parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits, cost and responsibility for implementation and supervision. Performance indicators requiring quantitative measurements are:

(i) Air Quality with respect to PM2.5, PM10, CO, NOx and SO2 at selected location.
(ii) Water Quality with reference to DO, BOD, Oil and grease, COD, Suspended Solids and Turbidity, Alkalinity rivers/streams and water bodies at selected points.

(iii) Noise levels at sensitive receptors (nearby community religious places).
(iv) Occupational Health and Safety data for employees and contractors working in the subprojects

Ambient Air Quality (AAQ) Monitoring: Ambient air quality parameters recommended for monitoring road development projects are PM2.5, PM10, Carbon Monoxide (CO), Oxides of Nitrogen (NOx) and Sulphur Dioxide (SO2). These are to be monitored, right from the commencement of construction activity at selected locations of plants and machinery, crushers on sites, excavation works etc. Data should be generated once in a season excluding monsoon in accordance with the National Ambient Air Quality Standards as per CPCB recent notification of 2009 **(Appendix 1).**

Water Quality Monitoring: The physical and chemical parameters recommended for analysis of water quality relevant to industrial development projects 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 given in the Environmental Monitoring Plan. The monitoring of the water quality is to be carried out at locations identified along the project road during construction and operation phase. The Indian Standard Specifications – IS10500: 1991 is given in **Appendix 2**. Surface water quality will be monitored as per fresh water classification of CPCB **(Appendix 2).**

Noise Level Monitoring: The measurements for monitoring noise levels would be carried out at sensitive receptors and construction sites around the industrial estates. The Ambient Noise Standards formulated by Central Pollution Control Board (CPCB) in 1989 or the standards by State Pollution Control Board if such standards are stringent than those of the CPCB are to be complied. The CPCB standards are given in **Appendix 3**. Sound pressure levels would be monitored on 24 hr. basis. Noise should be recorded at “A” weighted frequency using a “slow time response mode” of the measuring instrument.

Occupational Health and Safety Data: Regular health check records and safety data for employees and workers working in the SUBPROJECTSs operations will be monitored.

D. Environment Management Budget

An environmental management budget of INR 20,00,000 Lakhs has been estimated for implementation of the environmental management plan. This budget DOES NOT INCLUDE cost of environmental monitoring and associated trainings which will be a part of contractor’s budget. A detail of environmental management budget is given in **Table in Appendix.**

E. Generic Guidelines for Implementing EMP

A set of generic guidelines have been formulated to avoid potential impacts due to construction and its allied activities. These guidelines have been attached as Appendices with following headings.

X. CONCLUSION AND RECOMMENDATION

The proposed subproject components at Naidupeta have been categorized as Category 'B'. This is based on the fact that a Rapid EIA study for subprojects as a part of the industrial estate development has already been done and regular monitoring of EIA EMP's and EIA EMoP will be done as per statutory requirements by the Government agencies. The same will also be monitored by ADB as a part of the overall monitoring requirement. Hence a separate EIA study was not required and an IEE has been prepared linked with the existing EIA studies for the Naidupeta industrial estate.

Subprojects are located in the industrial estates and they are not located in any environmentally sensitive areas. It does not cover any reserve forest area and no diversion of forest land is required. Land acquisition has already been conducted by APIIC and no additional land is required for the development of this subproject.

The significant environmental impacts attributable to the subprojects pertain more during construction stage. Occupational Health and Safety of employees and workers and emergency preparedness for any accidental leak or failure are other significant impacts that need to be managed and controlled. These impacts are easily managed by adopting adequate and efficient operational practices, implementing and monitoring required guidelines, having adequate PPE's in place and effective implementation of Environmental Management Plan (EMP).

The initial environmental examination of the subprojects ascertains that the subproject studies and EIA's have been done and EMP's and EMoP's have been developed. The Executing Agency and APIIC shall ensure that EIA's EMP and EMoP along with this IEE's EMP and EMoP are included in Bill of Quantity (BOQ) and forms part of bid document and civil works contract. The same shall be revised if necessary during project implementation or if there is any change in the project design and with approval of ADB.

Appendix 1: National Ambient Air Quality Standards

Pollutant	Time weighted average	Sensitive area	Industrial area	Residential, rural & other areas	Method of measurement
Sulphur Dioxide (SO2)	Annual* 24 hours**	15 µg/m³ 30 µg/m³	80 µg/m³ 120 µg/m³	60 µg/m³ 80 µg/m³	Improved West and Gaeke Method Ultraviolet Fluorescence
Oxides of Nitrogen as NOx	Annual* 24 hours**	15 µg/m³ 30 µg/m³	80 µg/m³ 120 µg/m³	60 µg/m³ 80 µg/m³	Jacab & Hochheiser Modified (Na-Arsenite) method Gas phase Chemiluminescence
Suspended Particulate Matter (SPM)	Annual* 24 hours**	70 µg/m³ 100 µg/m³	360 µg/m³ 500 µg/m³	140 µg/m³ 200 µg/m³	High Volume Sampler (Average flow rate not less than 1.1 m³/minute)
Restorable Particulate Matter (RPM) size less than 10 µm	Annual* 24 hours**	50 µg/m³ 75 µg/m³	120 µg/m³ 150 µg/m³	60 µg/m³ 100 µg/m³	Respirable Particulate Matter Sampler
Pollutant	Time weighted average	Sensitive area	Industrial area	Residential, rural & other areas	Method of measurement
Lead (Pb)	Annual* 24 hours**	0.5 µg/m³ 0.75 µg/m³	1.0µg/m³ 1.5 µg/m³	0.75 µg/m³ 1.0 µg/m³	AAS Method after sampling using EPM 2000 or equivalent filter paper
Carbon Monoxide (CO)	8 hours** 1 hour	1.0 mg/m³ 2.0 mg/m³	5.0 mg/m³ 10 mg/m³	2.0 mg/m³ 4.0 mg/m³	Non - dispersive infrared Spectroscopy

Appendix 2: Guidelines of CPCB on Primary Water Quality

Designated Best Use	Class of Water	Criteria
Drinking water source (with conventional treatment)	A	Total Coliforms MPN/100ml shall be 50 or less pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 2 mg/1 or less
Outdoor bathing (organised)	B	Total Coliforms MPN/100ml shall be 500 or less pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/1 or less
Drinking Water Source (without conventional treatment)	C	Total Coliforms MPN/100 ml shall be 5000 or less pH between 6.5 to 8.5 Dissolved Oxygen 4 mg/l or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/l or less
Propagation of Wildlife	D	pH between 6.5 to 8.5 for Fisheries Dissolved Oxygen 4 mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C Max 2250μ mhos/cm Sodium absorption ratio Max. 26 Boron, Max. 2 mg/l

Appendix 3: National Ambient Noise Standards

Area Code	Category of Zones	Limits of Leq in dB(A)	
		Day time*	Night time*
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zone **	50	40

Day time is from 6 am to 9 pm whereas night time is from 9 pm to 6 am

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicles horns, loud speakers and bursting of cracking are banned in these zones

Appendix 4: DRINKING WATER QUALITY STANDARDS (AS PER IS: 10500-1991)

Sl. No.	Parameter and Unit	Desirable Limit	Permissible Limit in Absence of Alternate Source
1.	Colour (Hazen units)	5	25
2.	Odour	Unobjectionable	-
3.	Taste	Agreeable	-
4.	Turbidity (NTU)	5	10
5.	pH	5-8.5	No relaxation
6.	Total Coliforms (MPN/100 mL)	nil	-
7.	Pathogenic Organisms or Virus	nil	-
8.	TDS (mg/L)	500	2000
9.	Mineral Oil (mg/L)	0.01	0.03
10.	Free Residual Chlorine (mg/L)	0.2	-
11.	Cyanide (mg/L as CN)	0.05	No relaxation
12.	Phenol (mg/L C_6H_5OH)	0.001	0.002
13.	Total Hardness (mg/L as $CaCO_3$)	300	600
14.	Total Alkalinity (mg/L as $CaCO_3$)	200	600
15.	Chloride (mg/L as Cl)	250	1000
16.	Sulphate (mg/L as SO_4)	200	400
17.	Nitrate (mg/L as NO_3)	45	100
18.	Fluoride (mg/L as F)	1	1.5
19.	Calcium (mg/L as Ca)	75	200
20.	Magnesium (mg/L as Mg)	30	100
21.	Copper (mg/L as Cu)	0.05	1.5
22.	Iron (mg/L as Fe)	0.3	1
23.	Manganese (mg/L as Mn)	0.1	0.3
24.	Zinc (mg/L as Zn)	5	15
25.	Boron (mg/L as B)	1	5
26.	Aluminium (mg/L as AL)	0.03	0.2
27.	Arsenic (mg/L as As)	0.05	No relaxation
28.	Mercury (mg/L as Hg)	0.001	No relaxation
29.	Lead (mg/L as Pb)	0.05	No relaxation
30.	Cadmium (mg/L as Cd)	0.01	No relaxation
31.	Chromium (VI) (mg/L as Cr)	0.05	No relaxation

32.	Selenium (mg/L as Se)	0.01	No relaxation
33.	Anionic Detergents (mg/L MBAS)	0.2	1
34.	PAH (mg/L)	nil	-
35.	Pesticides (µg/L)	Absent	0.001
36.	Alpha Emitters (10^{-6}µc/mL)	nil	0.0001
37.	Beta Emitters (10^{-6}µc/mL)	nil	0.001

Appendix 5: Environment Management Budget

Table 1: Environment Management

Sl. No.	Item Description	Quantity	UNIT	Rate (Rs.)	Amount (Rs.)	Responsibility
A	**Environmental Monitoring**					
A.1	Ambient air quality monitoring.					Monitoring Amount Part of BOQ
A.2	Ambient noise level monitoring.					
A.3	Water quality monitoring of surface water					Contractor / APIIC to monitor compliance
A.4	Water quality monitoring of drinking water					APIIC
C	**Occupational Health and Safety (Health Tests)**				10,00,000	
D	**Environmental Training**				500,000	APIIC
D.1	Training at site as per **Appendix E of EMP.**					
	Grand Total = INR 15,00, 000					

Appendix 6: Environmental Management Plan

Table 1: ENVIRONMENTAL MANAGEMENT PLAN

S. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
PRE-CONSTRUCTION PHASE					
1	EIA Approval	Undertake all necessary requirements to obtain EIA approval for Naidupeta industrial estate including the proposed subprojects	Necessary planning and coordination with concerned authorities Prior notice to and consultation with concerned authority, public to be affected so as to ensure that work does not get affected.	APIIC	APPCB / MoEF
2	Contractor Preparatory Works		The Contractor will complete the following activities no later than 30 days upon issuance of Notice to Proceed Submit appointment letter and resume of the Contractor's Environmental Officer (EO) to SC/APIIC EO will engage CSC-Environment Specialist and to a meeting to discuss in detail the EMP, seek clarification and recommend corresponding revisions if necessary. 3.) EO will request CSC-ES copy of monthly monitoring formats and establish deadlines for submission. 4.) EO will submit for CSC-ES approval an action plan to secure all permits and approvals needed to be	Contractor	APIIC

			secured during construction stage which include but not limited to: i) disposal of hazardous waste (e.g. sludge, toxic untreated wastewater), ii) temporary storage location, iii) water use, and iv) ditch that will be managed for the period of construction and after construction such ditches will be filled and restored to original condition.		
3	Pollution	The proposed construction works related to internal roads, water supply, power transmission and distribution lines, etc. Temporary Diversion. Dust during earth works or from spoil dumps.	Air pollution during construction activities needs to follow all requirements relating to obtaining permits and maintaining emission requirements as per the statutory norms. Maintaining diversion and detour for road traffic in good shape and traffic regulated. Regular sprinkling of water, as necessary. Maintaining adequate moisture at surface of any earthwork layer completed or non-completed unless and until base course is applied, to avoid dust emission. Stockpiling spoil at designated areas and at least 5 m away from traffic lane.	Contractor Contractor Contractor	APIIC

4	Human wastes and wastewater		Providing septic tanks for treating sewage from toilets before discharging through soak pits Decanting and or controlled disposal of oil and grease as collected at collection tanks of maintenance yard and chemical storage areas	Contractor	APIIC
5	Noise Pollution and Vibration	Vehicles and Construction machinery	Protection devices (ear plugs or ear muffs) will be provided to the workers operating in the vicinity of high noise generating machines. Construction equipment and machinery should be fitted with silencers and maintained properly. Source-control through proper maintenance of all equipment. Use of properly designed engine enclosures and intake silencers. Noise measurements should be carried out along the road to ensure the effectiveness of mitigation measures. Vehicles and equipment used should confirm to the prescribed noise pollution norms.	Contractor	APIIC
6	Land Pollution	Spillage from plant and equipment at construction camp	Providing impervious platform and oil and grease trap for collection of spillage from construction equipment vehicle.	Contractor	APIIC

7		Domestic solid waste and liquid waste generated at camp	Collecting kitchen waste at separate bins and disposing of in a pit at designated area/s Collecting plastics in separate bins and disposing in deep trench at designated area/s covering with soil. Collecting cottons, clothes etc. at separate bins and burning in a pit (with sand bed)	Contractor	APIIC
8			maintenance platform Collection oil and lubes drips in container during repairing construction equipment vehicles Providing impervious platform and collection tank for spillage of liquid fuel and lubes at storage area		
09	Occupational health and safety of workers	Construction camp	• Water supply, sanitation, drainage and medical health facilities at campsite • Providing and using PPEs • Using working reverse horn for all construction equipment and vehicles	Contractor	APIIC
10	Accidents and safety	Construction sites	• Providing adequate light at construction zone if working during night time is permitted by the Engineer • Conducting induction and periodic training for all workers and supervisors	Contractor	APIIC

11	Construction of substations, installation of required equipment at substations, erection of transmission towers and stringing of conductors	Potential safety risks to community.	Provide fence or barricade (as appropriate), sufficient lights, clear warning signs and danger signals, and take all precautions identified in the community and safety plan Assign security personnel to prevent accidents, trespassing, and pilferage. Contractor(s) to direct drivers to strictly follow road regulations	Contractor	APIIC

Appendix 7: Environmental Monitoring Program

Table 1: ENVIRONMENTAL MONITORING PLAN

			MONITORING					RESPONSIBILITY	
Component	**Project Stage**	**Parameters**	**Measurement Method**	**Standards**	**Location**	**Frequency**	**Duration**	**Implementation**	**Supervision**
Air	Construction Stage	PM 2.5 PM 10 SO2 NO_x CO	Methods of Measurement as prescribed in National Ambient Air Quality Standard **(Appendix 7)**	National Ambient Quality Standards **(Appendix 7)**	Next to construction on area	Once a quarter	once	Contractor through approved monitoring agency	APIIC
	Operation Stage	Same as above	Same as above	Same as above	2 locations next to SUBPROJECTS holding tanks and outside boundary	As per Statutory requirements and Environmental Clearance conditions. as stated in EIA's of Naidupeta industrial estates)	As per Statutory requirements and Environmental Clearance conditions .(as stated in EIA's of Naidupeta industrial estates)	APIIC through approved monitoring agency	APIIC
Water Quality	Construction stage (surface water)	pH, temperature, turbidity, DO, BOD, COD, TDS, TSS, Oil & Grease	Grab sample collected from source and analyzed as per IS : 2488 (Part 1-5) methods for sampling and	Water quality standards by CPCB **(Appendix 8)**	1 locations	Once in a Quarter for 18 months	-	Contractor through approved monitoring agency	APIIC

			MONITORING					RESPONSIBILITY	
Component	**Project Stage**	**Parameters**	**Measurement Method**	**Standards**	**Location**	**Frequency**	**Duration**	**Implementation**	**Supervision**
	Operation Stage	Noise levels on dB (A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 10-15 m from edge of pavement	Noise standards by CPCB (**Appendix 9**)		Once a quarter for 18 months		APIIC through approved monitoring agency	APIIC
Occupational Health & Safety	Operation stage	As per the project requirements and worker profile	As per the project requirements and worker profile	As per Environmental Clearance requirements	As per Environmental Clearance requirements	As per Environmental Clearance requirements	As per Environmental Clearance requirements	ContractorAPIIC	

Appendix 8: REA CHECKLIST

Rapid Environmental Assessment (REA) Checklist

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Naidupeta Economic Zone Subproject – Augmenting utility services for Naidupet Industrial Cluster - VCICDP
Sector Division:	South Asia Urban and Water (SAUW)

Screening Questions	**Yes**	**No**	**Remarks**
B. Project Siting Is the project area…			
Densely populated?		✓	The industrial estates are far from the urban city and hence population is less.
Heavy with development activities?	✓		As and when more industries will come up, the activity in the area will increase
Adjacent to or within any environmentally sensitive areas?			
Cultural heritage site		✓	There are no environmentally sensitive areas located within the vicinity or 10 km radius of the 2 economic zones. Activities will be confined within the already built up/developed and demarcated areas of the economic zones.
Protected Area		✓	
Wetland		✓	
Mangrove		✓	
Estuarine		✓	
Buffer zone of protected area		✓	
Special area for protecting biodiversity		✓	
Bay		✓	
A. Potential Environmental Impacts Will the Project cause…			

impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	Not anticipated.
interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?		✓	Not anticipated.
dislocation or involuntary resettlement of people?		✓	Not anticipated.

Appendix 8

Screening Questions	**Yes**	**No**	**Remarks**
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Not anticipated.
impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		✓	
		✓	
		✓	
noise and vibration due to blasting and other civil works?		✓	Not anticipated.
risks and vulnerabilities related to occupational health and safety due to physical, chemical,and biological hazards during project construction and operation?		✓	Not anticipated. Workers may get exposed to dust and noise during construction activities. However the exposure levels are likely to be short and insignificant. Workers will be provided requisite PPEs to minimise such exposure and associated harmful occupational health effects. Traffic Safety measures will be adopted during operation phase.
		✓	

road blocking and temporary flooding due to land excavation during the rainy season?		✓	Not anticipated.
noise and dust from construction activities?	✓		Ambient noise level is expected to increase in the range of 80-90 dB(Aa) due to various construction activities, maintenance workshops, and earthmoving equipment. However there are no sensitive receptors in the economic zones. Nevertheless, stationary noisemaking sources equipment like diesel

Appendix 8

Screening Questions	**Yes**	**No**	**Remarks**
			generator sets and compressors will be installed with acoustic enclosures. Workers will be required to wear PPEs and exposure to noise will be limited as per EHS Guidelines.
traffic disturbances due to construction material transport and wastes?		✓	Not anticipated. Construction works are within the economic zones. Transportation routes will be through existing roads built for use of the economic zones.
temporary silt runoff due to construction?		✓	Not anticipated.
hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		✓	Not anticipated.
deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		✓	Not anticipated.
		✓	
		✓	
large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		✓	Not anticipated.

social conflicts between construction workers from other areas and community workers?		✓	Not Anticipated. Local workers will be employed for regular operations.
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	Adequate measures for transportation, storage and disposal will be implemented. Regular monitoring of the same will be conducted.
community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	Not anticipated.

Appendix 9

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:
Sector :
Subsector:
Division/Department:

Screening Questions		Score	Remarks[4]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

[4] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0

Response	Score
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High):__Low_____

Other Comments:_____
_____

Prepared by: _____

Appendix 10: Records of Public Consultation

The following table is the suggested format for recording the minutes of the public consultations conducted for the project.

Date and Venue of Public Consultation	Number of attendees	Issues /concerns raised during the public consultation	Response of the EA/IA on how to address the issues and concerns

Attachments:

Attendance sheets

Photo documentation

Appendix 11: SAMPLE ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

This template must be included as an appendix in the IEE that will be prepared for EACH sub- project. It can be adapted to the specific subproject as necessary.

I. Introduction

- Overall project description and objectives
- Description of subprojects
- Environmental category of the subprojects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and subproject progress and status

No.	Subproject Name	Status of Subproject				List of Works	Progress of Works
		Design	Preconstruction	Construction	Operational Phase		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

Compliance status with national/state/local statutory environmental requirements

No.	Subproject Name	Statutory Environmental Requirements	Status of Compliance	Action Required

Compliance status with environmental loan covenants

No. (List Schedule and Paragraph Number of Loan Agreement)	Covenant	Status of Compliance	Action Required

II. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

a. Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including environmental site inspection reports.

b. There should be reporting on the following items which can be incorporated in the checklist of routine environmental site inspection reports, followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection need to note and record the following:

- what are the dust suppression techniques followed for site, and if any dust was noted to escape the site boundaries;
- if muddy water was escaping site boundaries, or muddy tracks were seen on adjacent roads;
- adequacy of type of erosion and sediment control measures installed on-site, condition of erosion and sediment control measures, including if these were intact following heavy rain;
- are there designated areas for concrete works and refueling;
- are there spill kits on site, and if there are site procedure for handling emergencies;
- is there any chemical stored on site and what is the storage condition;
- are there any dewatering activities, if yes, where is the water being discharged;
- how are the stockpiles being managed;
- how are solid and liquid waste being handled on-site;
- review of the complaint management system; and
- checking if there are any activities being undertaken outside of working hours, and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum, those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-construction Phase						
Construction Phase						
Operational Phase						

Appendix 10

Overall Compliance with EMP

No.	Subproject Name	EMP Part of Contract Documents (Y/N)	EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

III. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the approach and methodology used for environmental monitoring of each subproject

IV. MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY, AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM_{10} µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM_{10} µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/l	TSS mg/l	TN mg/l	TP mg/l
Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/l	TSS mg/l	TN mg/l	TP mg/l

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)

			pH	Conductivity µS/cm	BOD mg/l	TSS mg/l	TN mg/l	TP mg/l

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Daytime	Nighttime

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Daytime	Nighttime

V. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

Appendix 12: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name

Contract Number

NAME: _____ DATE: _____

TITLE: _____ DMA: _____ LOCATION: _____ GROUP: _____

WEATHER CONDITION:

_____ _____

INITIAL SITE CONDITION:
_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:

_____ _____

Intervention steps:

_____

_____

Incident issues:

Resolution

Project activity stage	Survey	
	Design	
	Implementation	
	Pre-commissioning	
	Guarantee period	

Inspection

Emissions	Waste minimization
Air quality	Reuse and recycling
Noise pollution	Dust and litter control
Hazardous substances	Trees and vegetation

Site restored to original condition Yes ☐ No ☐

Signature

_____

Sign off

_____ _____

Name **Name**

Position **Position**

Appendix 13: CONSTRUCTION SITE CHECKLIST FOR EMP MONITORING

Project Name: RUSDP **Name of the Contractor:** **Yes (√) No (x)**

Monitoring Details: _____

EHS supervisor appointed by contractor and available on site

Construction site management plan (spoils, safety, material, schedule, equipment etc.,) prepared

Traffic management plan prepared

Dust is under control

Excavated soil properly placed within minimum space

Construction area is confined; no traffic/pedestrian entry observed

Surplus soil/debris/waste is disposed without delay

Construction material (sand/gravel/aggregate) brought to site as & when required only

Tarpaulins used to cover sand & other loose material when transported by vehicles

After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site

No AC pipes disturbed/removed during excavation

No chance finds encountered during excavation

Work is planned in consultation with traffic police

Work is not being conducted during heavy traffic

Work at a stretch is completed within a day (excavation, pipe laying & backfilling)

Pipe trenches are not kept open unduly

Road is not completely closed; work is conducted on edge; at least one line is kept open

Road is closed; alternative route provided & public is informed, information board provided

Pedestrian access to houses is not blocked due to pipe laying

Spaces left in between trenches for access

Wooden planks/metal sheets provided across trench for pedestrian

No public/unauthorized entry observed in work site

Children safety measures (barricades, security) in place at work sites in residential areas

Prior public information provided about the work, schedule and disturbances

Caution/warning board provided on site

Guards with red flag provided during work at busy roads

Workers using appropriate PPE (boots, masks, gloves, helmets, ear muffs etc)

Working conditions at SUBPROJECTS are assessed by EHS expert and ensure that there is no risk

Workers conducting or near heavy noise work is provided with ear muffs

Contractor is following standard & safe construction practices

Deep excavation is conducted with land slip/protection measures

First aid facilities are available on site and workers informed

Drinking water provided at the site

Toilet facility provided at the site

Separate toilet facility is provided for women workers

Workers camps are maintained cleanly

Adequate toilet & bath facilities provided

Contractor employed local workers as far as possible

Workers camp set up with the permission of PIU

Adequate housing provided

Sufficient water provided for drinking/washing/bath

No noisy work is conducted in the nights

Local people informed of noisy work o blasting activity conducted Pneumatic drills or other equipment creating vibration is not used near old/risky buildings

Appendix 14: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Telugu and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	**Place of registration**	**Project Town** **Project:**
Contact information/personal details		

Name	**Gender** *		Male **Age**		
			* Female		
Home address					
Place					
Phone no.					
E-mail					

Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below:

If included as attachment/note/letter, please tick here:
How do you want us to reach you for feedback or update on your comment/grievance?

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)
Mode of communication: Note/letter E-mail Verbal/telephonic

Reviewed by: (Names/positions of officials reviewing grievance)

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Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

Appendix 15

Picture of Initial Focussed Group Meeting held at Naidupeta Economic Zone