# Initial Environmental Examination

Document Stage: Final
Project Number: 48434-003
February 2019

# IND: Visakhapatnam Chennai Industrial Corridor Development Program – Naidupeta Economic Zone Subproject – Common Effluent Treatment Plant at Naidupeta

## Package No: VCICDP/APIIC/01

Prepared by Andhra Pradesh Industrial Infrastructure Corporation Limited, Government of Andhra Pradesh for the Asian Development Bank.

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Naidupeta Economic Zone Subproject – Common Effluent Treatment Plant at Naidupeta

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

## CURRENCY EQUIVALENTS

(as of 14 August 2018)

| | | |
|---|---|---|
| Currency unit | – | Indian rupee (Rs) |
| Rs1.00 | = | $0.01429 |
| $1.00 | = | INR69.96 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | - | AsianDevelopmentBank |
| APIIC | - | AndhraPradeshIndustrialandInfrastructure CorporationLimited |
| BGL | - | BelowGroundLevel |
| BOD | - | BiologicalOxygenDemand |
| BIS | - | Bureauof IndianStandard |
| CPCB | - | CentralPollutionControlBoard |
| DO | - | DissolvedOxygen |
| DoE | - | Departmentof Environment |
| PMC | - | ProjectManagementConsultant |
| EA | - | ExecutingAgency |
| EIA | - | EnvironmentalImpactAssessment |
| EMP | - | EnvironmentalManagementPlan |
| EMoP | - | EnvironmentalMonitoringPlan |
| ESO | - | EnvironmentalandSafetyOfficer |
| GoAP | - | Governmentof AndhraPradesh |
| GoI | - | Governmentof India |
| IEE | - | InitialEnvironmentalExamination |
| IMD | - | IndianMeteorologicalDepartment |
| IS | - | IndianStandard |
| MFF | - | MultiTrancheFinancialFacility |
| MoEF | - | Ministryof EnvironmentandForests |
| MSL | - | MeanSeaLevel |
| MW | - | MegaWatt |
| NGO | - | Non-GovernmentOrganization |
| NOx | - | OxidesofNitrogen |
| APIIC | - | ProjectImplementationUnit |
| RF | - | ReserveForest |
| ROW | - | RightofWay |
| PMSC | - | ProjectManagementandSupervisionConsultant |
| SPCB | - | StatePollutionControlBoard |
| SPM | - | SuspendedParticulateMatter |
| SO2 | - | SulphurDioxide |
| SSI | - | SmallScaleIndustries |

**NOTE**

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

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## EXECUTIVE SUMMARY

1. The Vishakhapatnam-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 Vishakhapatnam-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 AP (GoAP) to enhance manufacturing sector growth and create high quality jobs in the state of AP.

4. This Initial Environmental Examination (IEE) is an environmental safeguard assessment report for the APIIC Industrial Infrastructure upgradation subproject being proposed under the VCICDP. This IEE covers the proposed CETP installation at Naidupeta Economic Zone; Naidupeta Economic Zone and surrounding Industrial Estates are a part of APIIC industrial areas.

5. This IEE aims to (i) provide critical facts, significant findings, 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.

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 (SEMP) 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 SEMP; and (iv) budget for SEP implementation. No works are allowed to commence prior to approval of SEMP.

11. A copy of the EMP/approved SEMP 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.

13. The proposed Naidupeta Cluster comprises of the Naidupeta MPSEZ, IP-Naidupeta and IP-Attivaram. Environmental Clearance (EC) and Consent for Establishment (CFE) have beenobtainedfrom Ministry of Environment and Forest (MoEF), individually foreach component of the cluster.Public hearing / consultations have been carried out as a part of the Environmental Clearance. The proposed CETP for Naidupeta is for 3MLD capacity proposed as a modular unit in phases of 1 MLD capacity each.

14. Therefore as per ADB SPS, the subproject is classified as environmental Category Band 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 for the construction of a 1 MLD capacity CETP at the Naidupeta 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 Vishakhapatnam Chennai**

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.

| NameoftheEstate | Extent(inAcres) |
|---|---|
| MultiproductSEZ | 2,549 |
| NaidupetaIndustrialPark | 1,244 |
| AttivaramIndustrialPark | 406 |

Table 1: Major Industries in the Naidupeta Cluster:

| S.N | NameoftheIndustry | TypeofIndustry | Extent(inacres) | Remarks |
|---|---|---|---|---|
| | **MultiproductSEZ (MPSEZ)** | | | |
| 1 | M/s.GreentechIndustrie | Manufactureofautomobiles | 21 | Inoperation |
| | | components,automobile engines&machinery | | |
| 2 | M/s.PrimeElectricalsPvt. Ltd. | Manufactureandexportof powertransformers | 100 | Inoperation |
| 3 | M/s.HemairSystems IndiaLtd. | Cleanroomtechnology equipmentandHVAC equipmentandother accessories | 25 | Inoperation |
| 4 | M/s.AurobindoPharma Ltd. | Pharmaceuticalsand Formulations | 32 | Under constructio |
| | **IPNaiduepta** | | | |
| 1 | HindustanNationalGlass andIndustries | ManufactureofContainerGlass | 200 | Inoperation |
| 2 | SKICarbonBlack(India) PvtLimited | Manufactureofcarbonblack andpower( byproduct) | 60 | Inoperation |
| 3 | LoyalaTextilesLimited | ManufactureofYarnandFabric | 54 | Inoperation |
| 4 | BASFIndiaPvtLimited | ManufactureofAdditiveMixtures | 5 | Inoperation |
| 5 | ChemsynthLaboratories | Manufactureof Bulkdrugs | 50 | Yetto commence construction |
| | **IPAttivaram** | | | |
| 1 | DRAIndustries | ManufactureofMSBilletsand ConstructionSteel | 100 | Inoperation |
| 2 | NithyaSteelsandAlloys | SteelMeltingandSteelRolling | 20 | Inoperation |

APIIC has proposed to establish Common Effluent Treatment Plant to meet the requirements of Naidupeta industrial cluster. Keeping in view the current requirements, a 3.0 MLD CETP is proposed to be established in 3 units of 1 MLD each. The subproject is, therefore, establishment of 1 MLD capacity CETP.

The 1st module of the proposed Common Effluent Treatment Plant (CETP) will cater to a capacity of 1 MLD. The CETP is proposed as a Zero Liquid Discharge (ZLD) which will enable water conservation and also prevent any discharge to the nearby water body MamidiKalava which is being used for irrigation purposes. A part of the treated wastewater

will be used for maintaining the green belt within the Naidupeta-SEZ and the balance will be reused at the units as non-potable water for various applications.

**B. Purpose and objective of the study**

The environmental assessment study was conducted from March 2015 to July 2015 as part of feasibility study under ADB financed technical assistance to meet ADB requirements. The report has been updated after the detailed design for the CETP is completed. This version is based on pre-feasibility studies conducted, earlier EIA reports for the initial project stage, available secondary data, due diligence studies and preliminary DPR reports prepared for the CETP installation at Naidupeta. CETP development is one of the packages in the APIIC Infrastructure development subproject 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) and detailed design of CETP. 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 CETP. 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 being 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 |
|---|---|
| TechnicalDetails | APIICandDPRConsultant |
| Technical details of proposed CETPs | APIIC CETP consultant and site visit to existing CETP under operationatJedimetla,Hyderabad |
| Climaticcondition | IndianMeteorologicalDepartmentWebsites |
| Geology, Seismicity,Soil and Topography | State of Environment Report, Pollution Control Board, DPR and PrimarySurveys |
| LandUse/LandCover | StateoftheEnvironmentReport,SatelliteImagerybasedlanduse analysis |
| DrainagePattern | GoogleImage,DetailProjectReportandonsiteobservations |
| Forest/Vegetation | ForestRangeOffices/StateForestDepartment,AndhraPradesh |
| Archaeological/CulturalHeritage sites | ArchaeologicalSurveyofIndia |
| Statusoffishingactivity | DistrictFisheriesoffices |
| AirqualityNoise,SoilandWater | PrimarysurveybyDPRConsultants |
| Hazardous Waste Management practiceandrequirements | APPCB,DetailedProjectReport |
| Rivergeo-morphology,hydrology, drainage,floodpatterns, | DetailedProjectReport,Consultationandsiteverification |
| Soil profile and measures to control soilerosion | SoilConservationDepartment,Govt.of AndhraPradesh |
| GroundwaterConditions | CentralGroundwaterBoard |
| Socio-economicenvironment | DifferentGovt.agencies/civic bodies,officialwebsitesmaintainedby stategovt., censusofIndia2011,andpublicConsultation duringthe Fieldsurvey |

**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 socio- economic 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 1- Introduction
Chapter 2- Policy, Legal and Administrative Framework
Chapter 3- Description of Project
Chapter 4- Description of the Environment
Chapter 5- Anticipated Impacts and Mitigation Measures
Chapter 6- Public consultation and information disclosure
Chapter 7- Institutional Arrangements and responsibilities
Chapter 8- Institutional Capacity and Development
Chapter 9- Environmental management plan, monitoring plan and grievance redressal mechanism
Chapter 10- 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. AnEIA is required to address significant impacts.

ii. **Category B**. Projects could have some adverse environmental impacts, but of lesser degree orsignificance 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. NoEIA 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:

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

ii. Final or updated EIA and/or IEE upon receipt; and

iii. 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.

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 subproject 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 CETP Subproject**

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| 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 the entiresub project. | Non |
| 2 | EIA Notification,2006 | Environmental clearances (EC) | Construction of CETP/ STP/ WTP. The proposed component of the water supply, power distribution network, transmission lines and road construction are not anticipated to require EC. | CETP does not require Environmental clearance but the environmental clearance obtained from MoEFCC is applicable to the sub project |
| 3 | Water (Prevention and Control of Pollution) Act,1974amended 1988 and its Rules,1975 | • Consent for establishment (CFE) and consent for operation (CFO) from APPCB<br>• Compliance to conditions and disposal standards stipulated in the CFE and CFO | Applicable to all the sub project specifically for the construction and operation of sewage treatment plant and CETP | Consent to Establish and Consent to Operate is required from Andhra Pradesh Sate Pollution Control Board |
| 4 | Air(Prevention and Control of Pollution) Act,1981,amended 1987anditsRules,1982 | • CFE and CFO from APPCB as applicable<br>• Compliance to conditions and emissions standards stipulated in the CFE and CFO. | For the sub project, the following will require CFE and CFO: (i) diesel generators; (ii) hot mix plants; and (iii) vehicles emitting air pollutants. | Consent to Establish and Consent to Operate is required from Andhra Pradesh State Pollution Control Board |
| 5 | onmental (Protection) Act, 1986 amended 1991 and the following rules/notifications:<br>• Environment (Protection) Rules, 1986 including amendments<br>• Solid Waste Management Rules, 2016<br>• Construction and Demolition Waste Management | CETPs/STPs should be designed and operated to meet disposal standards. Inlet effluent at CETP should also meet the standards- compliance with emission and disposal standards during construction.<br>Solid waste and sludge generated at proposed facilities shall bed is posed in accordance with the MSWM Rules.<br>Compliance with noise | Applicable to all subprojects | No condition precedent NoC or license under this law for the CETP |

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| | Rules, 2016<br>• Noise Pollution (Regulation and Control) Rules, 2000<br>• Environmental Standards of Central Pollution Control Board (CPCB)<br>• Notification of Eco Sensitive Zones<br>• Wetland (Conservation and Management) Rules, 2010<br>Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 | standards<br>□ Compliance to environmental standards (discharge of effluents)<br>□ Restriction of activities (including construction, tree cutting, etc.) in the notified zones. There are no eco sensitive zones in or near the sub project locations<br>□ 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 sub project locations has protected wetlands<br>□ Rules defines and classifies hazardous waste provides procedures for handling hazardous waste<br>□ Requires Pollution Control Board's consent for handling hazardous waste<br>□ Procedure for storage of Hazardous wastes and provides procedures for recycling, reprocessing or reuse, important and export of hazardous waste<br>□ Rules for development of treatment, storage, disposal facility | | |

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| | | (TSDF) for hazardous wastes such that TSDF shall be developed following guidelines issued by CPCB | | |
| 6 | Contract Labour (Regulation and Abolition)Act,1970;<br>The Inter-State Migrant Workmen(Regulation of Employment and<br>Conditions of Service)Act, 1979 | Department of Labour, GoAP<br>As principle employer<br>Contractor shall register with Labour Department, GoAPif inter-state migrant workmen are engaged<br>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.<br>APIICs to obtain Certificate of Registration.<br>Contractors to obtain license from designated labour officer | Labour license is required |
| 7 | The Building and Other Construction Workers (Regulation of Employment and Conditions Of Service)Act,1996andtheCess Act of 1996 | Cessshould be paid at rate not exceeding 2% of the cost of construction as maybe notified<br>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.<br>The employer has toobtain a registration certificate from the Registering Officer | Applicable to any building or other construction work and employ 10 or more workers | Non |
| 8 | The Child Labour (Prohibition and Regulation)Act,1986 | No child below 14years 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 sub projects. | Non |
| 9 | Minimum Wages Act,1948 | All construction workers should be paid not less than | Applicable to all subprojects. | Non |

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| | | the prescribed minimum wage | | |
| 10 | Workmen Compensation Act, 1923 | Compensation for workers in case of injury by accident | Applicable to all sub projects. | Workmen compensation insurance is required |
| 11 | Equal Remuneration Act,1979 | Equal wages for work of equal nature to male and female workers | Applicable to all sub projects. | Non |
| 12 | AP State Environment Policy | Follows the National Environment Policy, 2006<br>Project implementation should adhere to the policy aims | Applicable to all sub projects. | Non |
| 13 | The Motor Vehicles Act,1988 | Standards for vehicular pollution and prevention control. The authority also checks emission standards of registered vehicles, collects road taxes, and issues licenses.<br>• In August 1997, the Pollution under Control Certificate (PUC) program was launched in an attempt to crackdown on the vehicular emissions in the States.<br>• 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. | Applicable to all sub projects. | Pollution under control certificate of vehicles operating for construction work is reqruied |
| 14 | Coastal Regulation Zone(CRZ) Notification 6thJanuary 2011<br>Central Government have declared the coastal stretches of seas, bays, estuaries, creeks, river sand back Waters which are | The main objectives of the Coastal Regulation Zone Notification,2011are:<br>to ensure livelihood security to the fishing communities and other local communities living in the coastal areas;<br>to conserve and protect coastal stretch e sand;<br>to promote development in a | Not applicable | Not applicable |

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| | influenced by tidal action(in the landward side) upto500m 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 6thJanuary2011. | sustainable manner based on scientific principles, taking into accountthe dangers of natural hazards in the coastal area sand sea level rise due to global warming. | | |
| 15 | Minor Mineral and concession Rules | For opening new quarries. Regulate use of minor minerals like stone, soil, rivers and etc. | Applicable to all sub projects. | Non |
| 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 riverbed sand quarries | Applicable to all sub projects. | Non |
| 17 | Notification for use of fly ash from thermal power plants within 100kmreachesofthe project. | The MoEF had issued in 2009 a notification that all brick units within100km 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 to all sub projects within 100km reaches of thermal power plants. | Non |
| 18 | Public Liability and Insurance Act1991 | Protection from hazardous materials and accident. | Applicable to all sub projects. | Non |
| 19 | National Environment Appellate Authority Act(NEAA)1997 | Grievances process and how they will be dealt with. | Applicable to all sub projects. | Non |
| 20 | Explosive Act1984– For transporting and storing diesel, bitumen etc. | Safe transportation, storage and use of explosive material. | Applicable to all sub projects. | Non |
| 21 | The Factories | The Act lays down the | Applicable to all sub | Non |

| SNo | Legislation | Requirements for the Project | Applicability | Regulatory certificate or license orNoC requirement |
|---|---|---|---|---|
| | Act,1948–The Andhra Pradesh Factory Rules | 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. | projects. | |
| 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 Plan by the district collector and the constitution off crisis groups at the center, district, and local levels for the management of chemical disaster. | Applicable to all sub projects. | Non |
| 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 | Permission is obligatory incase ground water is abstracted. |
| 24 | Permission for use of water for construction purpose from irrigation department | Use of surface water for construction | Applicable to all subprojects. To be obtained prior to initiation of any work involving use of surface water for construction | Permission is obligatory incase water is abstracted from irrigation channel. |

## 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 require 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.

(i) 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 ascategoryAifitislocatedinwholeorinpartwithin10 kmfrom theboundaryof protected areas, notified area sorinter-state or international boundaries.

Common Effluent Treatment Plant (CETP) development (new or modification) will attract EIA Notification.The design for the establishment and operation of 1.0 MLD capacity CETP at MPSEZ Naidupeta has been approved by APPCB wide letter no 230/PCB/CFE/RO-NLR/HO/2017 dated 27/12/18 (Appendix 1).

The Environmental Clearance (EC) and Consent for Establishment (CFE) for MPSEZ, IP-Naidupeta and IP-Attivaram has been granted by the Ministry of Environment, Forest and Climate Change (MoEF). Public hearing / consultations have been carried out as a part of the Environmental Clearance.

**Statutory Clearances obtained**

| S.No | Name of the Industrial Park | Environmental Clearance | Consent for Establishment |
|---|---|---|---|
| 1 | MPSEZ Naidupeta | F.No.21-61/2010-IA.III Dated: 26.02.2016 | Order No. 230 /APPCB/CFE/RO-NLR/HO/2016 Dt.28.12.2016 |
| 2 | IP-Naidupeta | F.No.21-140/2015-IA-111 Dated: 30.05.2017 | Order No. 235 /APPCB/CFE/RO-NLR/HO/2017 Dt: 06.09.2017 |
| 3 | IP-Attivaram | F.No.21-93/2014-IA-III Dated: 09.03.2017 | Order No. 236 /AP PCB/CFE/RO-NLR/HO/2017 Dt: 03.11.2017 |

*The above Environmental clearances can be downloaded from http://www.apiic.in/Envirnoment+Clearance

## D. International Environmental Agreements

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

Table 4: International Agreements and Applicability to Naidupeta CETP Subproject

| No. | Agreement | RequirementsfortheProject |
|---|---|---|
| 1 | ConventionontheTransboundaryMovements ofHazardousWastesandTheirDisposal,1989 Toprotecthumanhealthandtheenvironment against theadverseeffectsofhazardous wastes.Thisaimsat(i)reduction ofhazardous wastegeneration,promotionofenvironmentally soundmanagement (ii) restriction of transboundary movements, and (iii) a regulatory systemfor transboundary movements. | Sludge/rejects generatedfromtertiary treatmentprocesslikelytohave heavymetals andmayfallinhazardouswastecategory. Thesludge/rejects willbedisposedwithinthe country. |

| | | |
|---|---|---|
| 2 | United Nations Framework Convention on ClimateChange(UNFCCC),1993 | TheUNFCC isaninternationalenvironmental treatywiththemainobjective tostabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangeroushumaninterference withthe climatesystem. IndiasignedtheUNFCCon10June1992 andratifiediton1November 1993.The projectwillensure thatallconstruction activitieswillnotsignificantly increasethe GHGemissions andensurethatdesignofall infrastructure areresilientclimatechange 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) 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 project 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

### A. Location

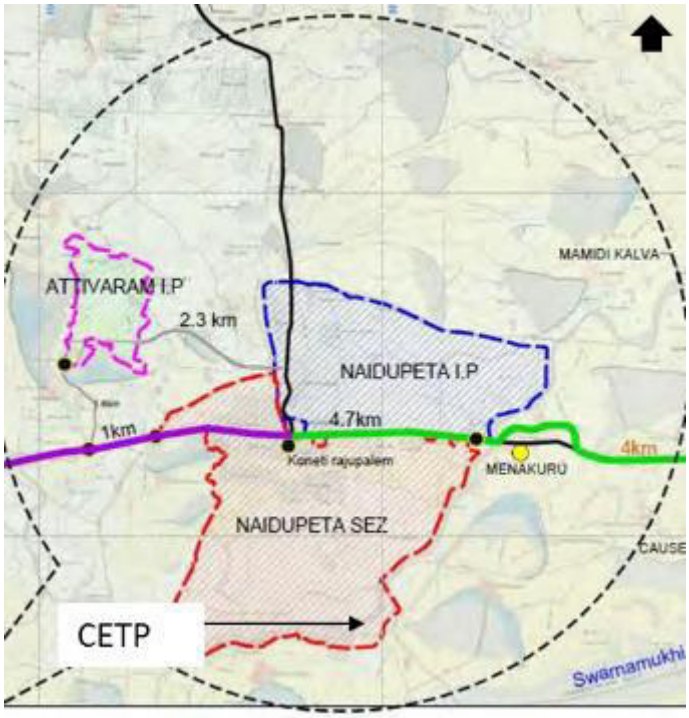


Figure 2: Proposed location of CETP at Naidupeta Industrial Cluster

Naidupetaindustrialclusterisamixedindustrytype.Currentlytheindustriesthathave beenestablishedorareunderestablishmentareengineering(transformers,ACcomponents, automobileparts)andpharmaceuticals(APIand formulation).InthenearbyIndustrialParkthe industriesestablishedor underestablishmentare textile, glass, paper andalliedproducts,bulk drug,food,chemical, cement products,plastics,paints,engineering andcarbon black.

Owing to its proximity to Chennai, a few garments and finished leather product (jackets, shoes) units are also anticipated. The source of raw water is from Telugu Ganga Canal and the quality of the water is expected to be good for direct use except for specific purposes like boiler feed, and industry specific needs.

Keeping in view the current requirements, the 3 MLD CETP is proposed to be established in 3 units of 1 MLD each. This section of the report shall deal with 1 MLD capacity CETP being proposed.

The 1st module of the proposed Common Effluent Treatment Plant (CETP) will cater to a capacity of 1 MLD. The CETP is proposed as a Zero Liquid Discharge (ZLD) which will enable water conservation and also prevent any discharge to the nearby water body MamidiKalava which is being used for irrigation purposes. A part of the treated wastewater will be used for maintaining the green belt within the Naidupeta-SEZ and the balance will be reused at the units as non-potable water for various applications.

The proposed CETP is designed to mainly cater to the following sector of industries which are expected to come up in the Naidupeta cluster - engineering, bulk drug &

pharmaceuticals, leather and textile garments, food, chemical, paper products, cement products and textile. The engineering sector has been further split in to metal pre-treatment and finishing (electroplating) and the manufacturing (mainly machining). The bulk drug and pharmaceuticals sector has been split in to manufacturing of API (Active Pharma Ingredients) and formulation units. It is observed1 that the textile units will be mainly for manufacturing readymade garments and food industries for processing of sea fish. The break up in terms of volumetric contribution (for the 1st 1,000 KLD CETP) is as given below:

Table 5: Estimated Volumetric Contribution to CETP of Different Sectors of Industry

| TYPEOFINDUSTRY | APPROXIMATE CONTRIBUTION(%) |
|---|---|
| APIUnits | 20 |
| PharmaceuticalSector(formulationunits) | 15 |
| LeatherandTextiles(semi-finishedtofinished) | 25 |
| Engineering | 15 |
| Chemical | 10 |
| Others | 15 |

In addition to above a flow of 100 KLD is being considered from the metal pre-treatment and finishing operations at the various engineering units. The operations carried out at these units will predominantly be de-rusting, de-greasing, metal plating (cadmium, zinc, nickel, chrome and copper) and also stripping.

**B. Waste Water Characteristics Expected at CETP**

At Naidupet industrial estate, high TDiS (TDiS:60000- 100000ppm) wastewater volume is expected to be 200 KLD and the low TDiS wastewater is expected to be 800 KL. This is apart from the 100 KL of the metal pre- treatment and finishing wastewater expected from the engineering sector. It is also proposed that the CETP would be designed to cater for the wastewater being generated at MPSEZ, IP-Naidupeta and IP-Attivaram. The definition of low TDiS and high TDiS wastewater is based on the CETP inlet standards stipulated by MoEF.

The characteristics of the wastewater that are expected from the metal pre-treatment and finishing units are considered as two parts: viz., i) alkaline and cyanide bearing effluents and ii) acidic and chrome bearing effluents. The individual units shall have to segregate the wastewater at the unit level sending it across to the CETP.

A waste water acceptance criterion will be developed during operation of the CETP where specific quality and characteristics of waste water for different sectors of industry will be defined along with maximum limits for different parameters beyond which the waste water will not be accepted by the CETP. The waste characterization criteria will be developed keeping in view the inlet water requirements as specified by the regulations and the capacity of CETP.

Presently, the industries are spread out in different areas within the cluster. There shall be in all 4 types of wastewater generated at the SEZ and the surrounding IP's. Currently, the wastewater can be conveyed to the CETP by tankers only. Each industry shall have a minimum of 2 tanks for each type of wastewater generated and the holding capacity of each tank shall be for a flow of 1 day. Depending on the wastewater characteristics, the unit shall have to provide screens, grit trap and oil and grease traps at the unit level to ensure that the CETP inlet standards are met.

Table 6: Inlet Effluent Quality for CETP

| Parameter | Concentrationinmg/l |
|---|---|
| pH | 5.5–9.0 |
| Temperature°C | 45 |
| Oil&Grease | 20 |
| PhenolicCompounds(as$C_6H_5OH$) | 5.0 |
| AmmonicalNitrogen(asN) | 50 |
| Cynide(asCN) | 2.0 |
| Chromiumhexavalent(as Cr+6) | 2.0 |
| Chromium(total)(asCr) | 2.0 |
| Copper(asCu) | 3.0 |
| Lead(asPb) | 1.0 |
| Nickel(asNi) | 3.0 |
| Zinc(asZn) | 15 |
| Arsenic(asAs) | 0.2 |
| Mercury(asHg) | 0.01 |
| Cadmium(asCd) | 1.0 |
| Selenium(asSe) | 0.05 |
| Fluoride(asF) | 15 |
| Boron(asB) | 2.0 |
| Radioactive b Materials | |
| Alphaemitters,Hc/ml | 10-7 |
| Betaemitters,He/ml | 10-8 |

Note: 1. These Standards apply to the small scale industries, i.e. total discharge upto 25 KL/Day. 2. For each CETP and its constituent units, the State Board will prescribe standards as per the local needs and conditions; these can be more stringent than those prescribed above. However, in case of clusters of units, the State Board with the concurrence of CPCB in writing, may prescribe suitable limits.

Once a tank (for a particular type of waste stream) is filled, the CETP operator shall be informed, who shall then send his representative to check the effluent quality (finger print test) and assign the path way for onward conveyance and treatment at the CETP. The treated effluent quality will conform to the requirements as detailed out in the table below.

Table 7: Treated Effluent Quality of CETP

| Parameter | Intoinlandsurface waters | OnlandforIrrigation | IntoMarineCoastal areas |
|---|---|---|---|
| | (a) | (b) | (c) |
| pH | 5.5-9.0 | 5.5–9.0 | 5.5–9.0 |
| BOD1[3daysat27°C] | 30 | 100 | 100 |
| Oil&Grease | 10 | 10 | 20 |
| Temperature | Shallnotexceed40°Cin anysectionof the stream within15metres downstreamfrom the effluentoutlet | - | 45°Catthepointof discharge. |
| SuspendedSolids | 100 | 200 | a) For process wastewater– 100<br>b) For coolingwater effluents10 percent abovetotal suspended matterof effluent coolingwater |
| DissolvedSolids | 210 | 210 | - |

| | | | |
|---|---|---|---|
| (inorganic) | 0 | 0 | |
| Totalresidualchlorine | 1.0 | - | 1.0 |
| Ammonicalnitrogen(asN) | 50 | - | 50 |
| Kjeldahlnitrogen(as N) | 100 | - | 100 |
| ChemicalOxygen Demand | 250 | - | 250 |
| Arsenic(asAs) | 0.2 | 0.2 | 0.2 |
| Mercury(asHg) | 0.01 | - | 0.01 |
| Lead(asPb) | 0.1 | - | 1.0 |
| Cadmium(asCd) | 1.0 | - | 2.0 |
| TotalChromium(asCr) | 2.0 | - | 2.0 |
| Copper(asCu) | 3.0 | - | 3.0 |
| Zinc(asZn) | 5.0 | - | 15 |
| Selenium(asSe) | 0.05 | - | 0.05 |
| Nickel(asNi) | 3.0 | - | 5.0 |
| Boron(asB) | 2.0 | 2.0 | - |
| PercentSodium | - | 60 | - |
| Cynide(asCN) | 0.2 | 0.2 | 0.2 |
| Chloride(asCl) | 1000 | 600 | - |
| Fluoride(asF) | 2.0 | - | 15 |
| Sulphate(as $SO_4$) | 1000 | 1000 | - |
| Sulphide(asS) | 2.8 | - | 5.0 |
| Pesticides | Absent | Absent | Absent |
| Phenoliccompounds ($asC_6H_5OH$) | 1.0 | - | 5.0 |

**C. Project Need and Cost:**

The total industrial area in MPSEZ and IP Naidupeta is around 2,074 acres and the effluent generation when all the plots are sold and industries established is estimated to be around 8.2 MLD. Since the requirement of facility is driven by the industrial requirements, APIIC intends to create this capacity in a phased manner. Naidupeta Cluster is mixed industry type. Currently the industries that have been established are engineering (transformers, AC components, automobile parts etc.) and pharmaceuticals (Active Pharma Ingredients and formulation). In the IPs the industries established /under establishment are textile, glass, paper and allied products, bulk drug, food, chemical, cement products,

plastics, paints, engineering, carbon black, etc. The wastewater discharge collected from the existing industries shows that the total effluent from the existing units (IP Naidupeta and MPSEZ) is around 445 cum/d (0.45 MLD) and from the already allotted units is around 244 cum/d (0.24 MLD). There is about 314 hectares of land soon to be allotted where industrial units are expected to come in in the next 2-3 years. Considering all there is an immediate need of an initial capacity of 1.0 MLD CETP.

Table 8: Summary of Cost of Block Items - Naidupeta

| S.no | NameofWork | Amount(Rs. Crores) |
|---|---|---|
| 1 | Civilunits | 8.63 |
| 2 | Electro-mechanicalunits | 20.45 |
| | **SubTotal(InRs.Crores)** | 29.08 |
| 3 | VAT@3.50% | 0.87 |
| 4 | ServiceTax@5.60% | 1.63 |
| 5 | LabourCess@1% | 0.29 |
| | **TotalTaxes** | **2.79** |
| | **TotalCost** | **31.87** |

**D. Proposed Scheme of Treatment**

Alkaline and cyanide streams (max. 50 KL/day): Wastewater bearing alkali and cyanides shall be segregated and collected in the tanks at the individual unit. Oil and grease shall be arrested at the unit itself. The wastewater shall be transported by tankers. The tankers shall be emptied in to oil and grease trap for entrapment of any oil and grease (that which would have escaped at the unit level). Following removal of oil and grease, the wastewater is taken to a sump / equalization tank having volume of 100 cum. In the equalization tank, air shall be bubbled thru a grid. This helps in mixing and avoids settling. The wastewater from the sump is pumped at a uniform and constant rate of 5 cum/hr for onward treatment. The treatment shall be 2 stage alkaline chlorination. In the first stage chlorine shall be added under alkaline conditions (high pH) and the cyanide shall be oxidized to cyanate. The cyanate is further oxidized to carbon di-oxide and nitrogen in the second stage reaction tank. Once the cyanide complex is broken the associated heavy metals are converted in to insoluble metal hydroxides and they shall settle down. The solid – liquid separation shall take place in the settling tank. The supernatant i.e., treated wastewater is taken to the sump and mixed with secondary treated process wastewater and shall be used as water for gardening / maintaining the green belt. The sludge shall be collected in the sump and shall be pumped to the sludge sump. The sludge shall be dewatered and dried prior to safe disposal.

Acidic and chrome bearing wastewaters (max. 50 KL/day): Wastewater bearing acids and chrome shall be segregated and collected in the tanks at the individual unit. Oil and grease shall be arrested at the unit itself. The wastewater shall be transported by tankers. The tankers shall be emptied in to oil and grease trap for entrapment of any oil and grease (that which would have escaped at the unit level). Following removal of oil and grease, the wastewater is taken to a sump / equalization tank having volume of 100 cum. In the equalization tank, air shall be bubbled thru a grid. This helps in mixing and avoids settling. The wastewater from the sump is pumped at a uniform and constant rate of 5 cum/hr for onward treatment. The treatment shall be 2 in stages. The first stage shall be reduction of hexavalent chromium to trivalent form under acidic conditions and the second stage shall be elevation of pH to about 8.2 for precipitation of chromium as chromic hydroxide which is in soluble and shall settle down. The solid – liquid separation shall take place in the settling

tank. The supernatant i.e., treated wastewater is taken to the sump and mixed with secondary treated process wastewater and shall be used as water for gardening / maintaining the green belt. The sludge shall be collected in the sump and shall be pumped to the sludge sump. The sludge shall be dewatered and dried prior to safe disposal.

**High TDiS Wastewater**

The high TDiS flow shall be 20% of the total waste flow generated and additionally the RO reject. The total waste flow (high TDiS) shall be 270KLD (High TDiS from industries would be 170KLD, another 90-100 KLD is expected from the RO rejects). Initially, the HTDiS wastewater generated from the industries shall be transported to the CETP by tankers. The tankers shall empty the HTDiS wastewater into the screen chamber where the screens shall retain the coarse matter. The screens are manual type and are to be cleaned at regular intervals. Screens provided in this case are fine screens. The screened wastewater shall be taken to an oil and grease trap for retaining floatables. The wastewater is then led to equalization tanks. In the equalization tanks, air shall be bubbled through a grid placed at the base of the tank for mixing the tank contents to obtain uniform characteristics of the wastewater.

Neutralization of the wastewater shall be done in the equalization tank itself by adding caustic or sulfuric acid as the case maybe. The HTDiS wastewaters shall be pumped from the equalization tank at a constant and uniform rate of 15cum/hr for onward treatment. For treating the HTDiS wastewater there shall be one stream operating at 15cum/hr.

**Primary Treatment**

The wastewater is first taken to a flash mixing tank wherein chemicals are added for coagulation and pH adjustment. The flash mixing tank is provided with motorized flash mixer device for homogenous mixing of chemicals and wastewater. Chemical preparation and feeding tanks are provided with agitators for preparation and feeding of chemicals required for treatment. For dosing of chemicals in a regulated manner dosing pumps are proposed.

Following chemical coagulation the wastewater is taken to a flocculation tank for flocculation. For flocculation, a slow speed motorized flocculator is provided. The wastewater is then taken to a tube deck settling tank for effective solid-liquid separation. Sludge collected in the settling tank shall be sent to sludge sump for onward handling of sludge.

Overflow from the primary settling tank shall be collected in a sump. RO reject from the low TDiS stream and the primary treated high TDiS wastewater shall be mixed/ homogenized in a sump. From the sump, the wastewater shall be pumped at a uniform rate for onward treatment. The units shall comprise of

- Stripper
- Multiple Effect Evaporator
- ATFD (Attached Thin Film Drier)

**Stream Stripper**

The stripper shall be used for removal of low boiling/ volatiles. These shall be condensed and removed from the top. The bottom stills shall be removed from the bottom.

These shall be one number stripper catering to a flow of 170KLD (this is excluding the RO reject from the low TDiS stream) of High TDiS wastewater. The type of stripper proposed is

steam stripper. Steam stripping is effective for stripping out most VOCs from wastewater in a wide range of concentrations. The process can strip the VOCs to extremely low concentrations in one operation without large increase in costs. The VOCs will be sold off or sent to cement kilns or sent for incineration. The stripper is couple to MEE which forms the first unit.The bottom stills shall be sent to HWMF for disposal by incineration.

**Multiple Effect Evaporators (MEE)**

Following stripping of VOC's , the High TDiS wastewater, will be fed to a MEE. There shall be one MEE in the first module catering to 15cum/hr feed rate. The MEE will concentrate the salts contents to about 30-35%. There shall be condenser attached to the MEE and the condensate will be collected and sent for treatment along with primary treated low TDiS wastewater. The volume of condensate is expected to be in the range of 60-70% of the feed to MEE. MEE is primarily used to condensate the TDiS in the wastewater. The condensate having very low TDiS can be treated along with LTDiS wastewater in a biological treatment system.

**Agitated Thin Film Dryer**

The concentrate from the MEE is fed to an ATFD for further drying and getting the salts in a near dry state. The salts produced at the ATFD are with 10-20% moisture content. The condensate from the ATFD is taken for treatment along with low TDiS wastewater.

The residuals generated in the pre-treatment process for the high TDiS wastewater shall be suitabley disposed off. The residuals generated are:

- Volatiles and bottom stills from the stripper shall be either sold off to an authorized person or incinerated at the incinerator of a hazardous waste management facility.
- Salts from the drier shall be bagged and sent to the hazardous waste management facility for disposal.
- Sludge from the primary ETP shall be dewatered, dried and sent to the hazardous waste management facility.

MEE and ATFD Condensate: this shall be collected in a tank and pumped to a mixing tank for further biological treatment with primary treated low TDiS wastewaters. Cooling tower bleed and boiler down shall also be taken along with condensate water to low TDiS stream for further treatment.

**Low TDiS Wastewater**

The expected quantity of low TDiS wastewater is 80% of the total flow ie, 800 cum/d at full load for the 1.0 MLD CETP. The condensate from the high TDiS stream shall be treated along with low TDiS wastewater.

In addition there shall be 100KL of treated wastewater from the metal pretreatment and finishing section. This shall be added to the secondary treated wastewater and used as water for gardening/ maintaining the green belt.

For the low TDiS treatment, the primary treatment shall be in one module catering to a capacity of 800 KLD. The secondary treatment shall be in 2 modules with each catering to 550KLD. The tertiary treatment shall be in a single module catering to 800KLD. About 300 KLD of secondary treated wastewater and 100 KLD shall be used as water for gardening /maintaining the green belt. The tertiary wastewater (about 700 KLD) shall be sent for reuse

at the industry for purposes other than potable water. About 100 kl/d is expected to come as a reject and this shall be send to the MEE at the High TDiS stream.

LTDiS wastewater from the individual units is received by tankers and is first tested at the CETP and is either accepted/ rejected or sent to HTDiS stream depending on the test results. The accepted LTDiS wastewater is led to the screen chamber. In the drains, screens shall be provided for retaining coarse matter. The screens are manual type and are to be cleaned at regular intervals. Only fine screens are provided. The wastewater is then taken to the grit chamber for removal of grit. Two such units (for use alternately) shall be provided. The wastewater is then led to an equalization tank. Here two equalization tanks are provided for alternate use. For mixing, and to avoid development of anaerobic conditions in the equalization tank, air shall be bubbled in the equalization tank through a grid placed at the base of the tank. The screenings and grit shall be disposed-off along with primary sludge.

From the equalization tank, the wastewater is pumped at a uniform and constant rate of 20cum/hr to flash mixing tank wherein chemicals are added for coagulation and pH adjustment. The flash mixing tank is provided with a flash mixer device for homogenous mixing of chemicals and wastewater. Chemical preparation and feeding tanks are provided with agitators for preparation and feeding of chemicals required for treatment. For dosing of chemicals in a regulated manner chemical dosing pumps are proposed.

Following mixing of chemicals and wastewater, the wastewater is taken to a flocculation chamber for flocculation. A mechanical flocculator shall be provided in the flocculation chamber. The wastewater is then subjected to solid-liquid separation in a primary clarifier tank. The sludge gets collected in the hopper bottom and shall be periodically collected in sludge holding tank, from where it will be pumped to the sludge thickener. Later sludge will be taken to sludge dewatering system by centrifuge/ filter press. Clarified water shall overflow from the tank and shall be taken to mixing tank before being subjected to secondary treatment.

The condensate from high TDiS stream (about 300KLD-maximum quantity) from the MEE and ATFD condensates tank is pumped to a mixing tank where it gets mixed with primary treated LTDiS wastewater stream. The mixing tank is provided with 2 days of retention time. For mixing of LTDiS wastewater and MEE condensate air shall be bubbled in the mixing tank. The characteristics of the mixed wastewater (condensate and the primary treated low TDiS wastewater), which shall be fed to biologicaltreatment. The secondary treatment is proposed in 2 equal modules.

The combined wastewater from the mixing tank is subjected to bio-chemical oxidation in two stage aeration system. The first stage of aeration is designed as an attached growth system (MBBR – Moving Bed Biological Reactor) and second stage as an extended aeration system. Nutrients shall be added to maintain the desired BOD. N:P ratio 100:5:1. Aeration in the $2^{nd}$ stage aeration tank shall done by diffused air aeration. In the MBBR coarse bubble diffusers shall be used. Following Bio-Chemical oxidation, the wastewater from the MBBR is subjected to further bio-chemical oxidation in $2^{nd}$ stage aeration tank. The second stage aeration tank is designed as a conventional activated sludge process working as an extended aeration system.

Following bio-chemical oxidation, the wastewater from the second aeration tank is taken to second stage clarifier for solid-liquid separation. The sludge from the secondary clarifier following second stage aeration is recycled back to the aeration tank to maintain the desired MLSS concentration.

The excess sludge from the 2nd stage secondary clarifier is taken to thickener for thickening of sludge. The thickened sludge is dewatered in a centrifuge/ Filter Press. Decanted water from the centrifuge / Filter press will be routed back to the equalization tank.

The proposed layout of CETP is shown in fig. 3.


**Figure 3: CETP proposed plant layout at Naidupeta**

The technical details including design and operational parameters for CETP are available in the DPR for CETP developed by APIIC.

The CETP is a Zero Liquid Discharge (ZLD) system. The residuals generated shall be

(i) Solvents at full load shall be about - 2 KL/day - this can be sold to re-claimers or incinerated at the TSDF

(ii) Salts at full load shall be about 14 tons/day with about 20% moisture content.

(iii) About 400 $m^3$/day of treated wastewater with TDiS of about 2000 mg/l shall be used for gardening / maintaining the green belt.

(iv) About 685 cum/day of treated wastewater with TDiS of about 100 mg/l. This water shall be reused at the industry for purposes other than potable application.

Considering the above, there seem no direct negative impacts owing to establishment of the CETP. There shall be an overall reduction in the water consumption as major part of the treated wastewater shall be reused. This shall drastically reduce the stress on the raw water consumption at the IP however there shall be substantial power and energy consumed in treating the wastewater and there is no alternative to that as a ZLD system is being proposed.

## IV. DESCRIPTION OF THE ENVIRONMENT

Environmental: The proposed Naidupeta Cluster comprises of the Naidupeta MPSEZ, IP-Naidupeta and IP- Attivaram. Environmental Clearance (EC) is being applied individually for each component of the cluster. The process for obtaining Environmental clearance for MPSEZ, IP Naidupeta and IP Attivaram has been completed and Environmental clearance has been issued by Ministry of Environment and Forest (MoEF). Public hearing / consultations have been carried out as a part of the Environmental.

Social: The area identified for the proposed summer storage tank is coming within MPSEZ and the entire land is in possession of APIIC. The land is devoid of any settlements and as such there will be no Land acquisition and Resettlement or Rehabilitation.

Project Influence Area (PIA)/Project Study Area: 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 in MPSEZ area

### A. Physical Resources

District Profile: Nellore is the southernmost district of Andhra Pradesh bordering Tamil Nadu. It lies between 13014' and 15007' N Latitudes and 70005' and 80005' 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 Cuddapa 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 BaironkondaQuartzites, 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 capping 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. 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.

Regional 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 30 year period (1970-2000), is presented in Table 9. The monthly variations of the relevant meteorological parameters are reproduced in the table.

Table 9: Climatological Summary – Nellore Region

| Month | Temp(°C) | | Rainfall(mm) | | Relative Humidity(%) | | StationLevel PressurehPa | | Mean Wind Speed (km/h) | Predominant Wind Directions (From) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily Max. | Daily Min. | Total | No.ofdays | 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 Climatalogical data for temperature, rainfall, relative humidity and mean wind speed are presented in below figures.


Figure 4: 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.

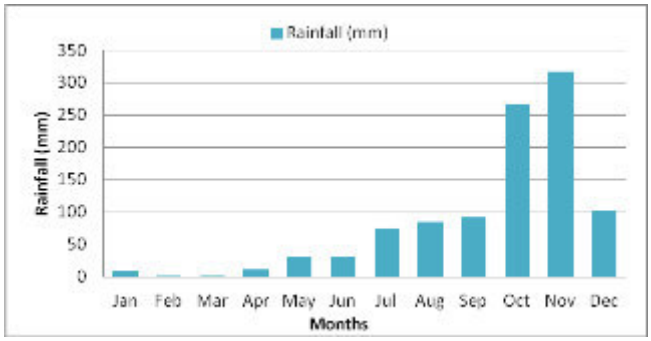


Figure 5: Annual Rainfall

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 6: Variation in mean wind speed

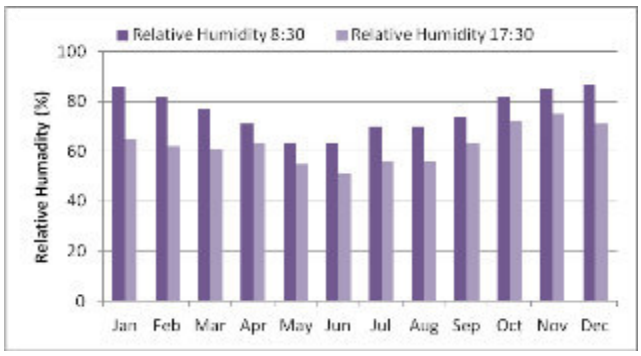


Figure 7: Variation in relative humidity

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 8.

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.

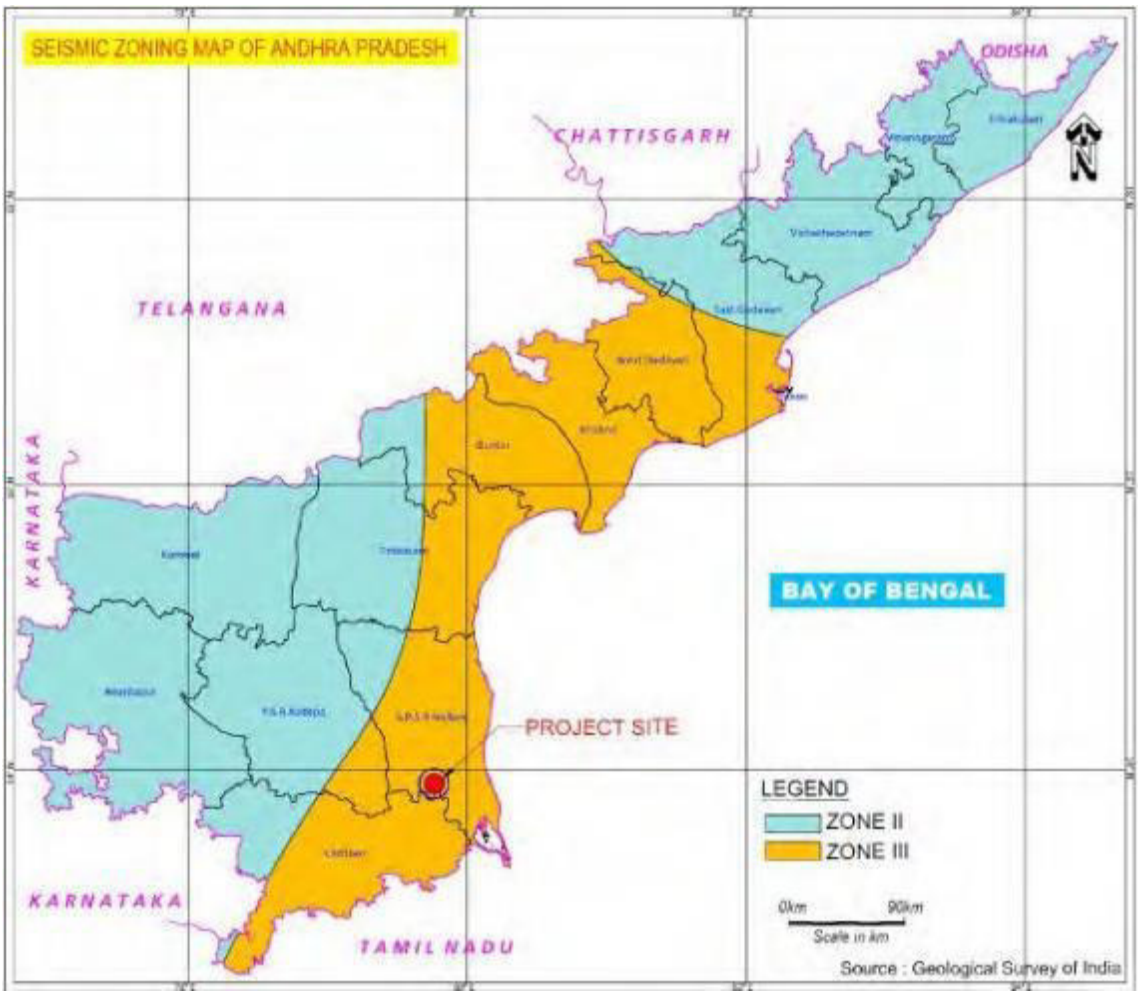


Figure 8: Seismic zoning map

**B. Socio-economic Profile of Naidupeta Cluster**

Demographic Profile: Naidupeta Cluster falls under three mandals i.e., Naidupeta, Pellakur and OjiliMandals comprising six (6) villages. As per Census 2011, the villages comprises of total population of 7,234 persons with 1,967 number of households. Total male population is 3,655 persons and female population is 3,579. 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 3,645 persons which is 50.38% of the total population. Male workforce comprises of 2,185 persons whereas female workforce comprises of 1,460 persons. 2,966 persons come under the category of Main workers and 679 persons consist of Marginal workers. Around 3,589 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**

The baseline environmental conditions in the project region have been established based on the earlier data generated in the region. The source of the data presented in the following sections is reproduced from the EIA Report prepared for IP Naidupeta by L&T Infrastructure Engineering Limitedin year 2016. The IPNaidupeta has received the Environmental Clearance.

Site Specific Meteorology: Site-specific meteorological data of wind speed, wind direction, temperature and solar radiation pertaining to summer season (March – May), 2016 was collected and presented below.

Temperature: The minimum and maximum temperatures observed are 20.650C to 37.850C

Relative Humidity: The minimum and maximum relative humidity recorded is 37% to 100% respectively.

Rainfall: Total rainfall recorded was 79.2 mm/hr and average is 0.04 mm/hr.

Wind Frequencies: The wind frequencies during the study (24 hourly interval) are presented below

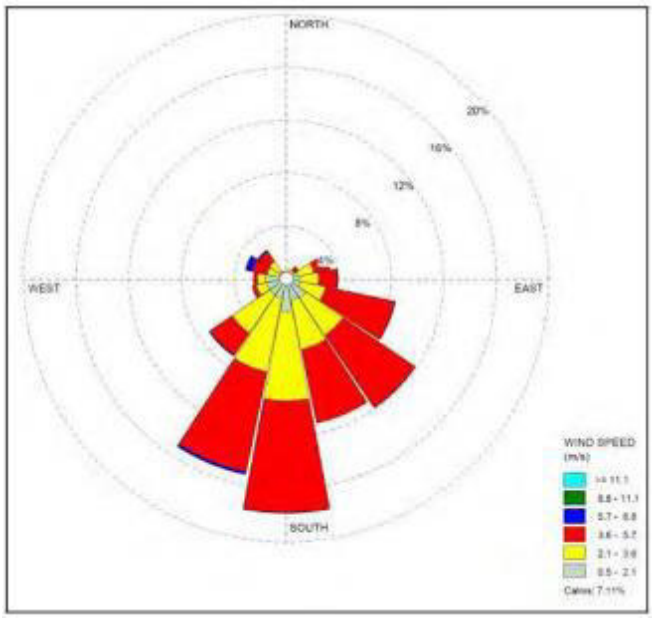


Figure 9: Windrose diagram

Ambient Air Quality: Ambient air quality was monitored twice in a week for One (01) season (12 weeks), i.e. during Summer 2016 (March to May, 2016). $PM_{10}$, $PM_{2.5}$, $SO_2$& NOx were monitored on 24 hourly basis and $O_3$ and CO were monitored on eight hourly basis. Sampling was carried out as per Central Pollution Control Board (CPCB) monitoring guidelines at each location. Details of the monitoring/sampling locations are provided below

**Table 10: Monitoring Locations**

| StationCode | Location | Distance(km)fromI.Pboundary | Azimuth Directions |
|---|---|---|---|
| A1 | ProjectSite | | |
| A2 | Manavali | 1.4 | NE |
| A3 | Dwarakapuram | 2.0 | SW |
| A4 | Graddaguntа | 2.3 | E |
| A5 | Mummavapalem | 2.4 | NW |
| A6 | Attivaram | 3.2 | W |
| A7 | Chigurupadu | 4.0 | SE |
| A8 | Kundam | 4.6 | NW |
| A9 | KappaguntaKandriga | 5.0 | S |
| A10 | Saguturu | 5.7 | N |

A map showing the Air monitoring locations is shown as Figure below

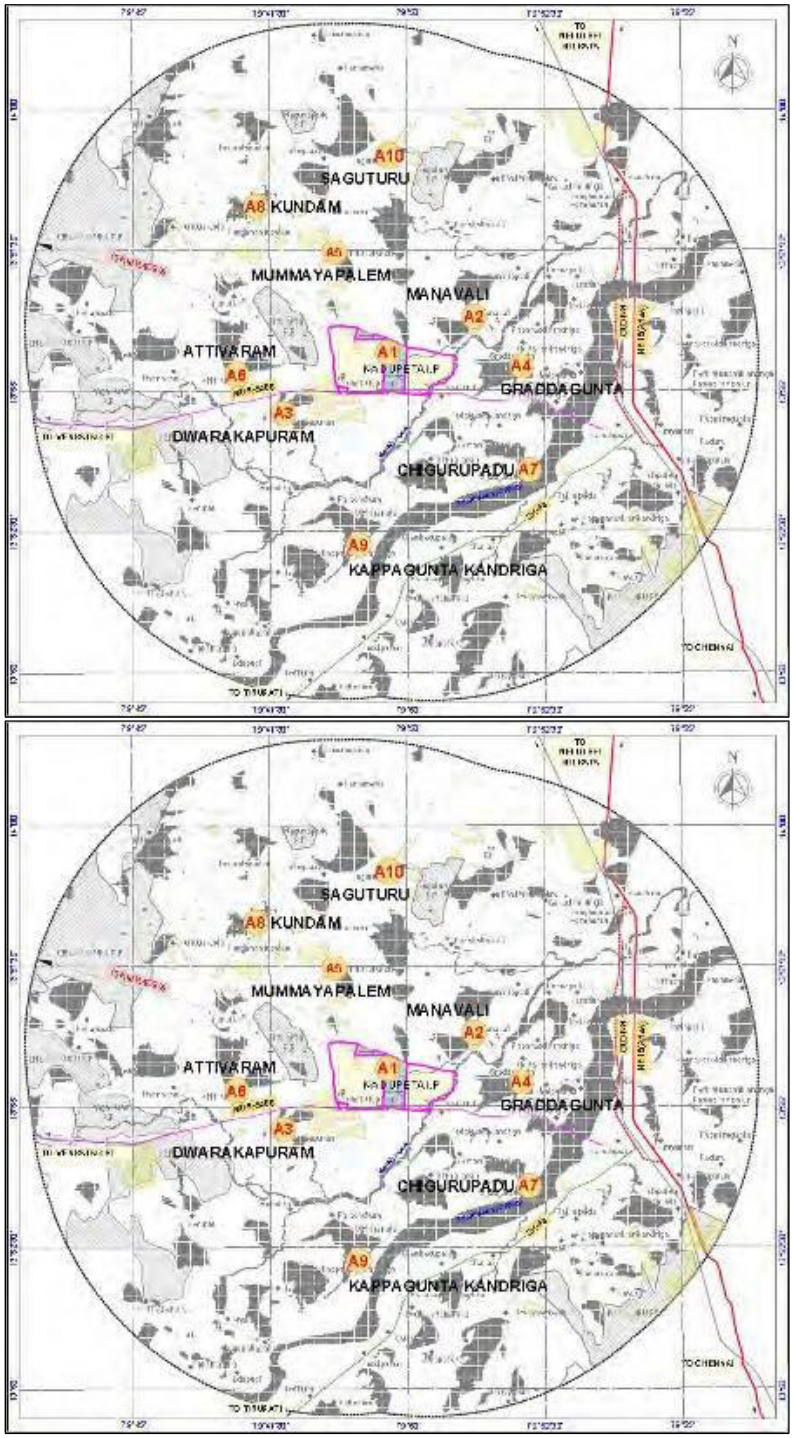


Figure 10: Monitoring location map

The variations of $PM_{10}$, $PM_{2.5}$, $SO_2$, NOx, CO, and $O_3$ have been compared with National Ambient Air Quality Standards (NAAQS), MoEF Notification, November, 2009. Ambient Air Quality status in the project region as reported in the report is reproduced below Monitoring Data (March to May, 2016) is given in tables and also graphically presented in figures.

Table 11: Ambient $PM_{10}$, $PM_{2.5}$, $SO_2$ and $NO_2$ Monitoring Data

| S.No. | Location | $PM_{10}(\mu g/m^3)$ | NAAQStandardfor$PM_{10}(\mu g/m^3)$ |
|---|---|---|---|

| | | Max. | Min. | Mean | 98$^{th}$Percentile | (24hr) |
|---|---|---|---|---|---|---|
| 1. | ProjectSite | 61 | 31 | 45 | 59.6 | 100 |
| 2. | Manavali | 47 | 22 | 32 | 46.1 | 100 |
| 3. | Dwarakapuram | 46 | 26 | 36 | 45.1 | 100 |
| 4. | Graddagunta | 44 | 25 | 32 | 42.6 | 100 |
| 5. | Mummayapalem | 44 | 26 | 34 | 43.1 | 100 |
| 6. | Attivaram | 44 | 22 | 32 | 43.1 | 100 |
| 7. | Chigurupadu | 41 | 22 | 32 | 41.0 | 100 |
| 8. | Kundam | 44 | 25 | 31 | 42.6 | 100 |
| 9. | KappaguntaKandriga | 44 | 22 | 33 | 43.1 | 100 |
| 10. | Saguturu | 44 | 22 | 34 | 44.0 | 100 |
| S.No. | Location | $PM_{2.5}$(µg/m3) | | | | NAAQStandardfor$PM_{2.5}$(µg/m3) (24hr) |
| | | Max. | Min. | Mean | 98$^{th}$Percentile | |
| 1. | ProjectSite | 29 | 13 | 28.2 | 38.6 | 60 |
| 2. | Manavali | 23 | 10 | 15.8 | 22.5 | 60 |
| 3. | Dwarakapuram | 22 | 12 | 16.7 | 22.0 | 60 |
| 4. | Graddagunta | 23 | 11 | 14.8 | 20.7 | 60 |
| 5. | Mummayapalem | 23 | 11 | 15.8 | 23.0 | 60 |
| 6. | Attivaram | 22 | 10 | 14.8 | 22.0 | 60 |
| 7. | Chigurupadu | 23 | 10 | 14.8 | 22.1 | 60 |
| 8. | Kundam | 23 | 11 | 14.4 | 21.6 | 60 |
| 9. | KappaguntaKandriga | 23 | 10 | 14.8 | 22.1 | 60 |
| 10. | Saguturu | 23 | 10 | 15.9 | 22.1 | 60 |
| S.No | Location | $SO_2$(µg/m3) | | | | NAAQStandardfor$SO_2$(µg/m3) (24hr) |
| | | Max. | Min. | Mean | 98$^{th}$Percentile | |
| 1. | ProjectSite | 14 | 10 | 12 | 14 | 80 |
| 2. | Manavali | 13 | 9 | 11 | 13 | 80 |
| 3. | Dwarakapuram | 13 | 9 | 11 | 13 | 80 |
| 4. | Graddagunta | 13 | 9 | 11 | 13 | 80 |
| 5. | Mummayapalem | 13 | 9 | 11 | 13 | 80 |
| 6. | Attivaram | 13 | 9 | 11 | 13 | 80 |
| 7. | Chigurupadu | 13 | 9 | 11 | 13 | 80 |
| 8. | Kundam | 13 | 9 | 11 | 13 | 80 |
| 9. | KappaguntaKandriga | 13 | 9 | 11 | 13 | 80 |
| 10. | Saguturu | 13 | 9 | 11 | 13 | 80 |
| S.No | Location | $NO_2$(µg/m3) | | | | NAAQStandardfor$NO_2$(µg/m3) (24hr) |
| | | Max. | Min. | Mean | 98$^{th}$Percentile | |
| 1. | ProjectSite | 17 | 12 | 15 | 17 | 80 |
| 2. | Manavali | 15 | 11 | 13 | 15 | 80 |
| 3. | Dwarakapuram | 15 | 1 | 12 | 15 | 80 |
| 4. | Graddagunta | 15 | 11 | 13 | 15 | 80 |
| 5. | Mummayapalem | 15 | 11 | 13 | 15 | 80 |
| 6. | Attivaram | 15 | 11 | 13 | 15 | 80 |
| 7. | Chigurupadu | 15 | 11 | 13 | 15 | 80 |
| 8. | Kundam | 15 | 11 | 13 | 15 | 80 |
| 9. | KappaguntaKandriga | 15 | 11 | 13 | 15 | 80 |
| 10. | Saguturu | 15 | 11 | 13 | 15 | 80 |

**Table 12: Ambient $O_3$ monitoring data**

| S.No | Location | $O_3$(µg/m3) | | NAAQStandardfor$O_3$(µg/m3) (8hr) |
|---|---|---|---|---|
| | | Max. | Min. | |
| 1. | ProjectSite | 50.00 | 30.67 | 100 |
| 2. | Manavali | 35.33 | 20.00 | 100 |
| 3. | Dwarakapuram | 35.33 | 20.67 | 100 |
| 4. | Graddagunta | 32.67 | 24.67 | 100 |
| 5. | Mummayapalem | 34.67 | 24.67 | 100 |
| 6. | Attivaram | 32.00 | 22.67 | 100 |
| 7. | Chigurupadu | 32.00 | 22.00 | 100 |
| 8. | Kundam | 38.00 | 24.67 | 100 |
| 9. | KappaguntaKandriga | 40.00 | 23.33 | 100 |
| 10. | Saguturu | 34.67 | 23.33 | 100 |

**Table 13: Ambient CO Monitoring Data**

| S.No | Location | CO(mg/m3) | | NAAQStandard forCO(mg/m3) (8hr) |
|---|---|---|---|---|
| | | Max. | Min. | |
| 1. | ProjectSite | 1.61 | 1.15 | 2 |
| 2. | Manavali | 1.38 | 1.26 | 2 |
| 3. | Dwarakapuram | 1.38 | 1.27 | 2 |
| 4. | Graddagunta | 1.38 | 1.27 | 2 |
| 5. | Mummayapalem | 1.38 | 1.27 | 2 |
| 6. | Attivaram | 1.38 | 1.27 | 2 |
| 7. | Chigurupadu | 1.38 | 1.27 | 2 |
| 8. | Kundam | 1.38 | 1.27 | 2 |
| 9. | Kappagunta Kandriga | 1.38 | 1.27 | 2 |
| 10. | Saguturu | 1.38 | 1.27 | 2 |

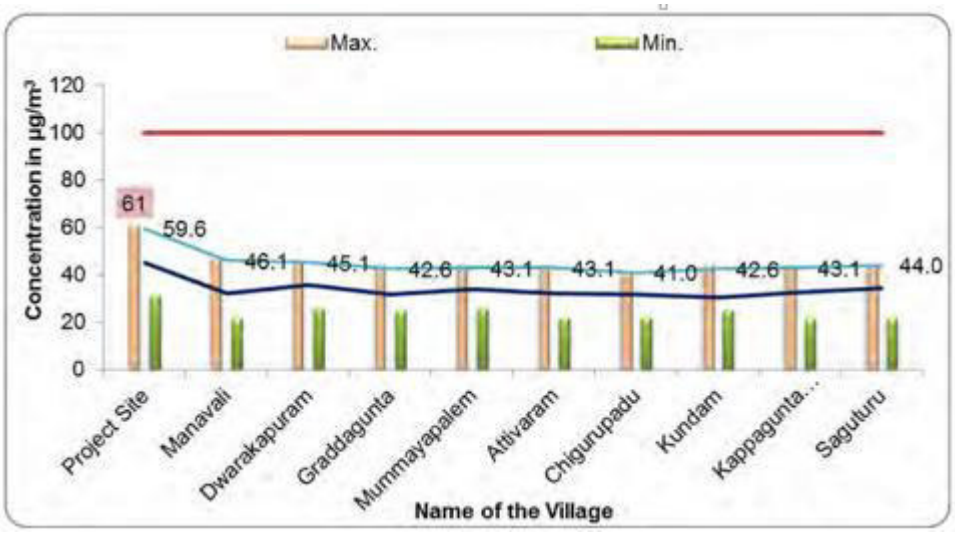


Figure 11: Ambient $PM_{10}$ Levels

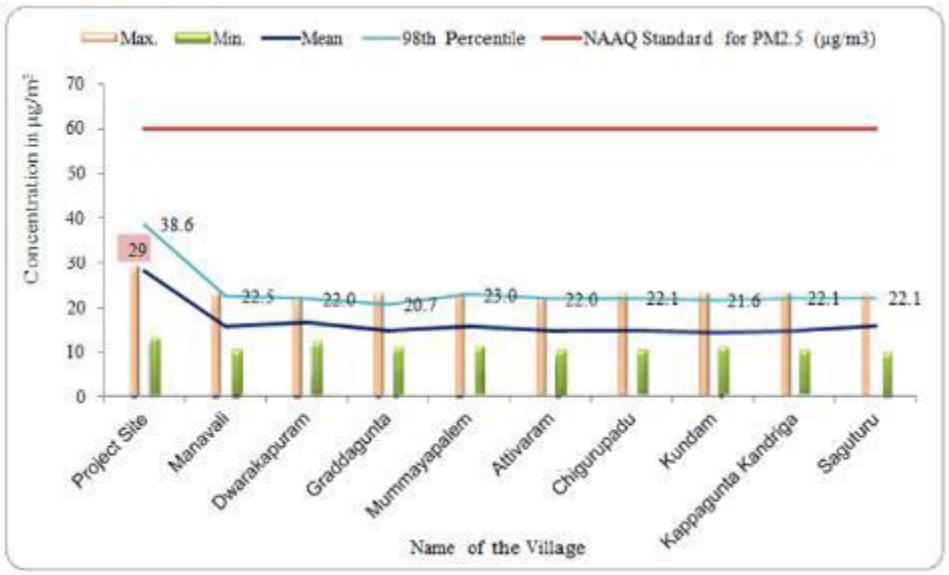


Figure 12: Ambient $PM_{2.5}$ Levels

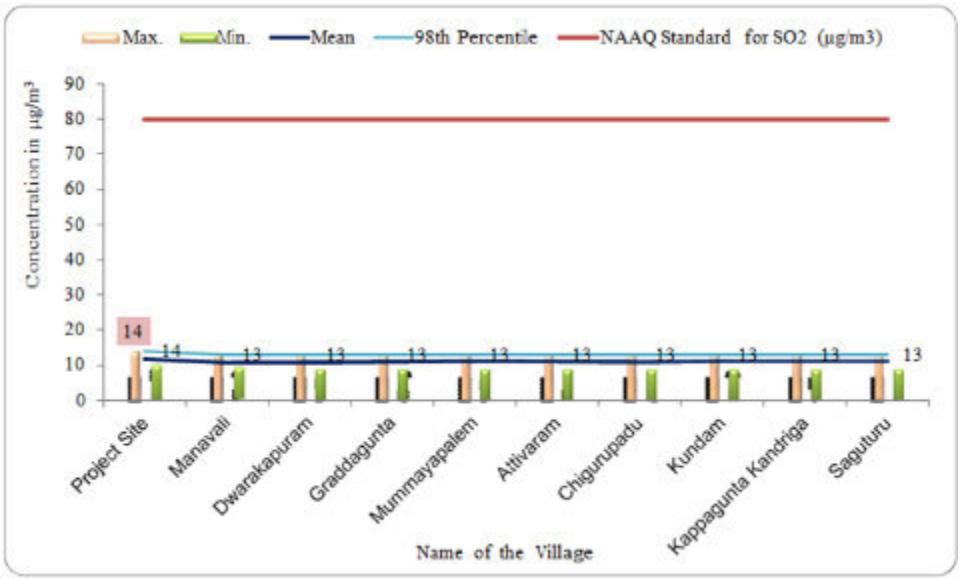


Figure 13: Ambient $SO_2$ Levels

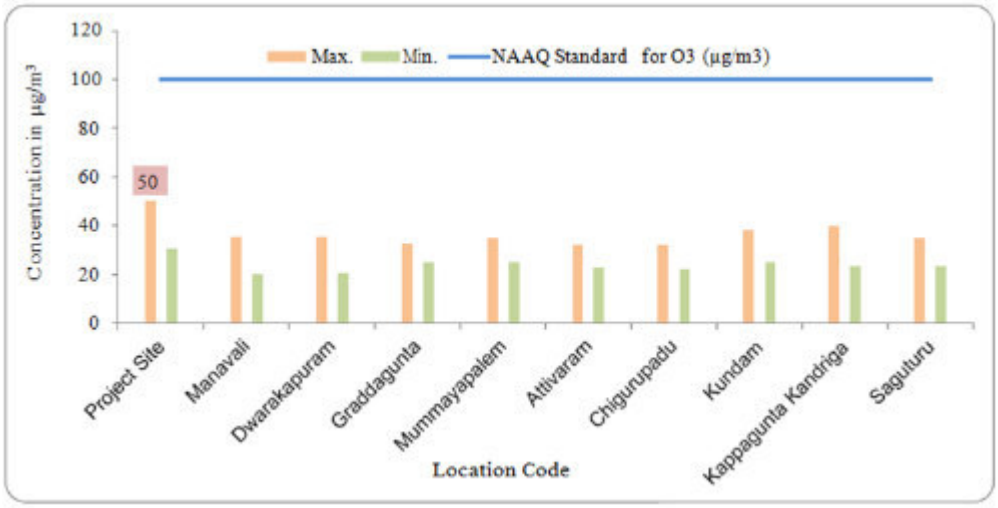


Figure 14: Ambient $O_3$ levels

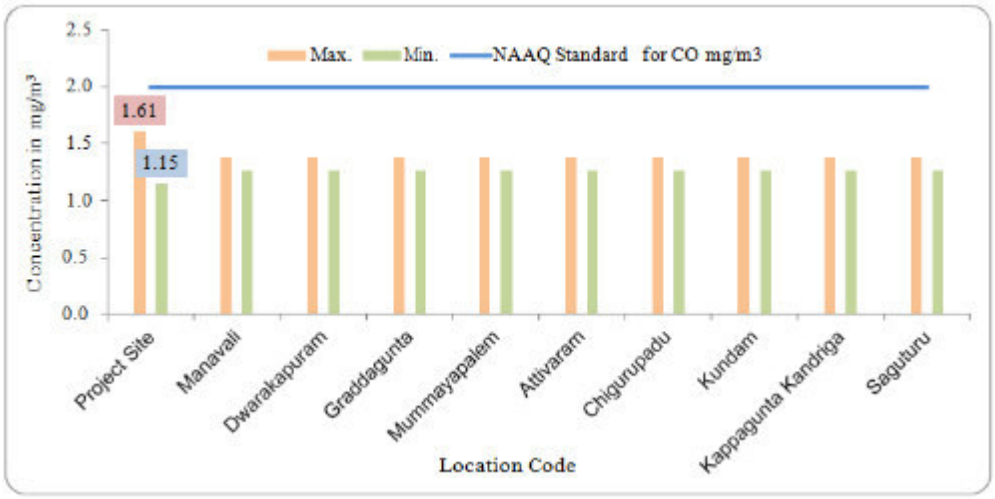


Figure 15: Ambient CO levels

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

Noise: Ambient noise levels have been established by monitoring noise levels at Ten (10) locations in and around 10Km distance from Naidupeta I.P using precision noise level meter. The comparison of day equivalent noise levels (Ld) and night equivalent noise levels (Ln) with the respective CPCB stipulated noise standards for various land use categories are shown in the Table 14 and presented in Figure.

Table14: Day and Night Equivalent Noise Levels

| S. No | Location | Distance (km)from Project boundary | Azimuth Directions | Noiselevelin dB(A)Leq | | CPCBStandard | | Environmental Setting |
|---|---|---|---|---|---|---|---|---|
| | | | | Day | Night | Lday(Ld) | LNight(Ln) | |
| 1. | ProjectSite | | | 66.51 | 54.96 | 75 | 70 | Industrial |
| 2. | Manavali | 1.4 | NE | 48.72 | 44.96 | 55 | 45 | |
| 3. | Dwarakapuram | 2.0 | SW | 53.28 | 46.41 | 55 | 45 | |
| 4. | Graddagunta | 2.3 | E | 48.93 | 44.98 | 55 | 45 | |
| 5. | Mummayapalem | 2.4 | NW | 45.67 | 46.58 | 55 | 45 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6. | Attivaram | 3.2 | W | 56.08 | 53.73 | 55 | 45 | Residential |
| 7. | Chigurupadu | 4.0 | SE | 57.51 | 52.23 | 55 | 45 | |
| 8. | Kundam | 4.6 | NW | 51.54 | 43.68 | 55 | 45 | |
| 9. | Kappagunta Kandriga | 5.0 | S | 48.00 | 45.59 | 55 | 45 | |
| 10. | Sanguturu | 5.7 | N | 53.23 | 46.84 | 55 | 45 | |

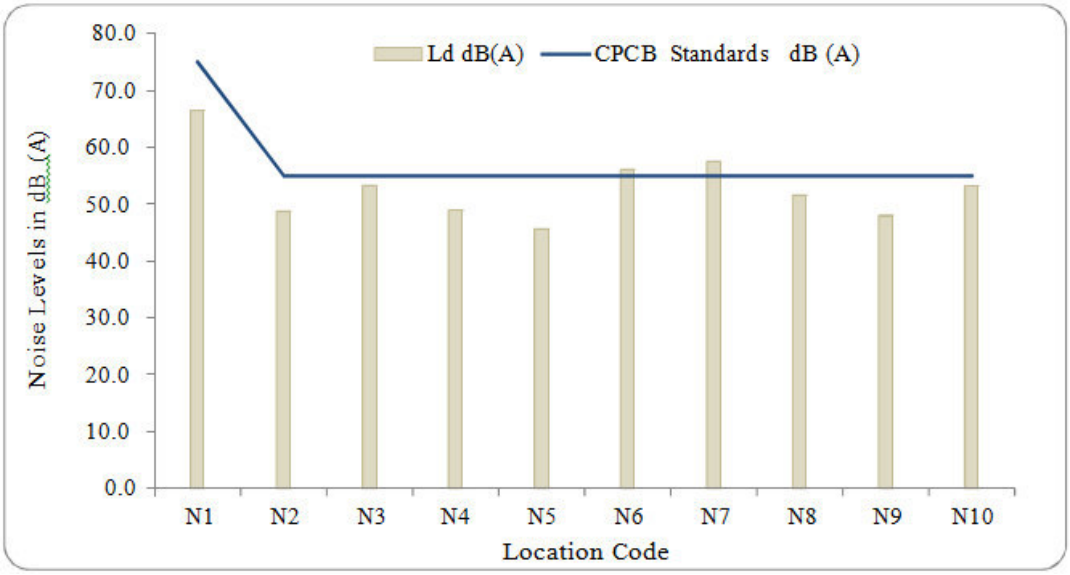


Figure 16: Ambient day time noise level

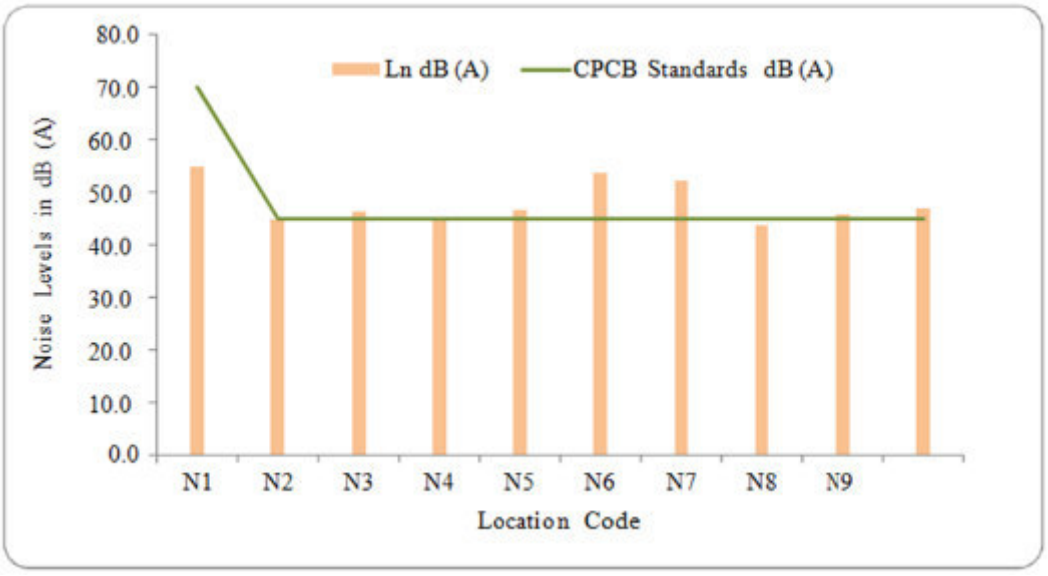


Figure 17: Ambient night time Noise levels

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 the noise levels were within the prescribed standards for industrial 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 6.96 to 7.84 indicating that the soils are falling in normal class
- The Electrical Conductivity varied from 210 to 491 µmhos/cm indicating that the soils are falling in the normal category
- Nitrates ($NO_3$) varied between 6 mg/100 gm and 14 mg/100 gm
- Phosphate ($PO_4^{-2}$) varied between 8 mg/100 gm and 15 mg/100 gm
- Potassium (K) varied between 7 mg/100 gm and 18 mg/100 gm

Water Quality

Summary of the results of water quality analysis as reproduced from Naidupeta I.P EIA report is presented below:

Ground Water

- pH is varying from 6.99 to 8.01 indicating the results are within the limits for drinking water samples (i.e. 6.5 to 8.5).
- Total Dissolved Solids are varying from 540 mg/l to 5050 mg/l; results indicated that TDS levels are above the acceptable limits (500 mg/l) and permissible limits (2000 mg/l).
- Chloride levels were reporting ranging from 106 mg/l to a maximum of 1531.2 mg/l; results indicate that Chloride levels are mostly above the acceptable limits (250 mg/l) and permissible limits (1000 mg/l).
- Hardness is varying from 104 mg/l to 1020 mg/l; results indicate that Hardness in some samples were below the acceptable limit (300 mg/l), some samples is having value above the acceptable limit but within the permissible limit (600 mg/l).
- Fluoride values were in the range of 0.57 mg/l to 1.66 mg/l; results show that most of the samples Fluoride levels in all samples were within the acceptable limit (1 mg/l) except few.

Surface Water

- pH was found varying between 7.61 and 8.74 which are meeting the IS: 2296-1982 standard for inland surface water
- Total Dissolved Solids were in the range between 266 mg/l and 1280 mg/l
- Chlorides ranged between 49.6 mg/l and 368.8 mg/l
- Total Hardness (as $CaCO_3$) ranged between 125 mg/l and 378 mg/l

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. Prosopisjuliflora, 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.

# V. ANTICIPATED ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

Industrial Infrastructure improvement 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 CETP subproject. 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 subproject have already been conducted as a part of the EIA studies for Naidupeta estates.

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.

Table 15: Anticipated impacts

| ProjectActivities | Concerns | Significance | | | |
|---|---|---|---|---|---|
| Pre-Construction | | | | | |
| ConstructionSite Clearance | Clearingofvegetation/impactonlandscape | | ● | | |
| | LossofTopsoil andchangeincharacteristics | | ● | | |
| | Lossoftrees&vegetablecover | ● | | | |
| | Noise,vibrationand dust nuisancefromsite clearanceactivity | | | ● | |
| Constructioncamp establishment&operation | Frictionbetweenconstructionpersonnelandlocal population | ● | | | |
| | Increasedpressureonlocalservices | ● | | | |
| | Waterpollutionfromsanitaryandotherwastes | | ● | | |
| | Reductioninlandqualityonabandonment | ● | | | |
| ConstructionStage | | | | | |
| Constructionof structures | Inducementoftrafficcongestiondelays | | ● | | |
| | Disturbanceofsedimentsinwaterquality | | ● | | |
| | Airpollution | | ● | | |
| | Noise&vibrationimpactsfromconstruction machinery | | | ● | |
| OperationStage | | | | | |
| Operation | Pollutionfromspillage's/surfacerun-off | | ● | | |
| | Impactstoairqualityduetoindustrialactivities, vehicularmovements,etc. | | ● | | |
| | Increaseincongestiononconnectingroads | ● | | | |

## A. Beneficial Impacts

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

CETP subproject will result in effective management of industrial waste water and hazardous waste and conservation of water through zero discharge. This will help in attracting different sectors of industries including polluting industries to the industrial estate due to availability of adequate infrastructure to better manage the industrial waste water 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 estates 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 multiproduct SEZ 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. Management of hazardous waste and efficient management of CETP 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 CETPs are modular structures which 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 CETP 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 are 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 large quantity of 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 SEZ 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) of 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 CETP are 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 project 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 CETP. Overall the impact of this on the site environment will be temporary.

**7. Impact on ecology/Biodiversity**

The proposed subproject is part of SEZ area 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 CETP will be placed in the industrial estate only. No new land acquisition is required for the CETP or for the pipeline for discharge of treated effluents.

(ii) Impact on historical monuments / religious structures: There are no adverse impacts expected on historical places/monuments.

**(iii) Physical Cultural Resources (PCR)**

There are no community property resources like temples, Churches, Masjids or community halls available within the project influence area. Subproject is in an industrial estate free from PCR.

## 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 CETP operations include pollutants during treatment, particularly Volatile Organic Compounds (VOC's) from holding chambers or treatment cells, emissions from diesel generator sets and boilers.

**Mitigation Measures:**

(i) The waste water holding tanks and treatment chambers will be provided with suitable measures to prevent leakage and emissions of VOC's.

(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.

### 2. Impact on Occupational health

The handling of waste water, emissions during holding and treatment, discharge of pollutants, transportation and storage of raw materials are the activities that are likely to have an impact on occupational health and safety. This impact may be significant particularly for personnel exposed during longer time periods to such emissions. Regular rotation of employees conducting similar different tasks, efficient use of PPE's and better transportation and storage methods will help reduce the impact.

**Mitigation Measures:**

(i) The waste water holding tanks and treatment chambers will be provided with suitable measures to prevent leakage and emissions of VOC's.

(ii) Monitoring devices will be installed to regularly monitor and check any leakages.

(iii) 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.

(iv) 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.

(v) Adequate PPE's will be provided to people working in the vicinity of these areas. 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, during holding and treatment, discharge of pollutants, 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 VOC's.

(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.

**4. Impact due to Odour**

The odours compounds which will be emitted from CETP will impact the air quality in the surrounding area, if not properly controlled.

**Mitigation Measures**

(i) Provision of green buffer/plantation along the periphery of site

(ii) Suitable odour mitigation plant species will be identified during greenbelt and green areas development

(iii) Odour from area sources will be minimized by atomized spray of water

(iv) Periodical checking of treatment plants for efficient operation

(v) Sludge from treatment plants will be handled in most appropriate manner to avoid putrefied smell

(vi) Generation of data based information on the magnitude of the odorous gases/chemicals in ambient

(vii) Environment around the sources by odour pollution measurement.

**E. Solid Waste Management**

**1. Sludge from CETP**

The solid waste from CETP comprises of boiler ash and other hazardous waste. The boiler ash can be used in brick manufacturing and sold to brick manufacturer. The hazardous waste generated from the process i.e., sludge from primary clarifier, salt from MEE, etc. would be disposed at authorized TSDF.

**2. Sludge from WTP**

The sludge will be dewatered in the Sludge drying beds proposed at WTP and the dried sludge will be used as manure for greenbelt development within the Cluster.

Impact due to emergency scenario of accidental discharge of untreated or toxic chemicals: CETP operations will involve storage and handling of toxic chemicals such as

Chlorine, ammonia, cyanide, etc. Any event leading to accidental discharge of such chemicals will lead to major impacts on the people and surrounding environment. An emergency preparedness and response plan will be prepared and regularly tested through mock drills to ensure that the industrial estates are fully prepared and equipped to meet any such scenario.

**Mitigation Measures:**

(i) The waste water holding tanks and treatment chambers will be provided with suitable measures to prevent leakage and emissions of VOC's.

(ii) Regular stability checks and inspections of the tanks will done to ensure such events are prevented.

(iii) Monitoring devices will be installed to regularly monitor and check any leakages.

(iv) Adequate PPE's will be provided to people working in the vicinity of these areas.

### 3. Unanticipated Impacts during Construction and Operation

86. 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.

## F. EHS guidelines of World Bank and Good International Industry Practice (GIIP)

World Bank and IFC formulates the general EHS guidelines will be applicable and implemented through EMP and Environmental Monitoring Plan. The general EHS guidelines are available online and can be accessed at website address

https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES.

# 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) avoidanceofpotentialconflicts forsmoothprojectimplementation. Itwillalsoprovideadequate opportunities forconsultationandparticipationtoallstakeholdersandinclusionofthepoor, vulnerable,marginalizedand APs in theprojectprocess.

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. The minutes of public consultation has been enclosed along with this report as **Appendix 16**.

Table 16: Details of Public Hearing and Stakeholder Consultation Meeting held on 28.07.2015 for Naidupet Economic Zone

| Sl. No. | Name | Representative Section | Issuediscussed | 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 | |
| 3. | Sri. L. ChenchuBabu | R/O Menakur Village | Allocation of sufficientfunds under CSR for environmental water pollution control. Formation of a committee for overseeing implementation. | |
| 4. | Dr.RKrishnaiah | Political Party Representative, Naiduepta | | |
| 5. | A Madhusudan Rao | R/O Menakur Village | Effective pollution control measures for preventing health risks such as asthma, etc. | |
| 6. | MuppalaParadhamraju | R/O. Konetupalemvillage, ward member | Loss of grazing land due to industrial activity | |
| 7. | Sri V Sunanda Reddy | NGO Representative, Nalgonda | Emphasized need for ground water harvesting and development of a green belt. | |
| 8. | SriPuttaKrishna | R/O Menakur Village | Adequate compensation to be paid | |
| 9. | Smt. S Navaneethamma | R/O Menakur Village | Adequate compensation to be paid | |
| 10. | Sri Suresh | R/O Menakur Village | Village road widening for safety | |
| 11. | Sri K Sudhakar Reddy | R/O Menakur Village | Adequate water storage, green belt development and adequate medical facilities | |
| 12. | Sri Pothurasi Subramanyam | R/O Menakur Village | Occupational health and safety and adequate provision of PPE's | |

**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 reports for industrial estate including the CETP component have been disclosed and environmental clearance from the ministry of environment and forests is already obtained.

95. Information is disclosed through public consultation and making relevant documents available in public locations.

1. Office of Zonal Manager, APIIC, Nellore.
2. APIIC web site
3. Construction site office, MPSEZ Naidupeta
4. The Commissioner of Industries & Project DirectorV.C.I.C. D.P. PMU,1St floor, Govt. Printing Press,Muthyalapadu, Vijayawada..

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.Government of Andhra Pradesh has already issued a Government Order No GO.RT.No. 163 dated 08-06-2018constituting GRC (Appendix 2)

**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, ZillaParishad; (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 redress 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.

Recordkeeping. Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date 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.

The GRCs will continue to function throughout the project duration

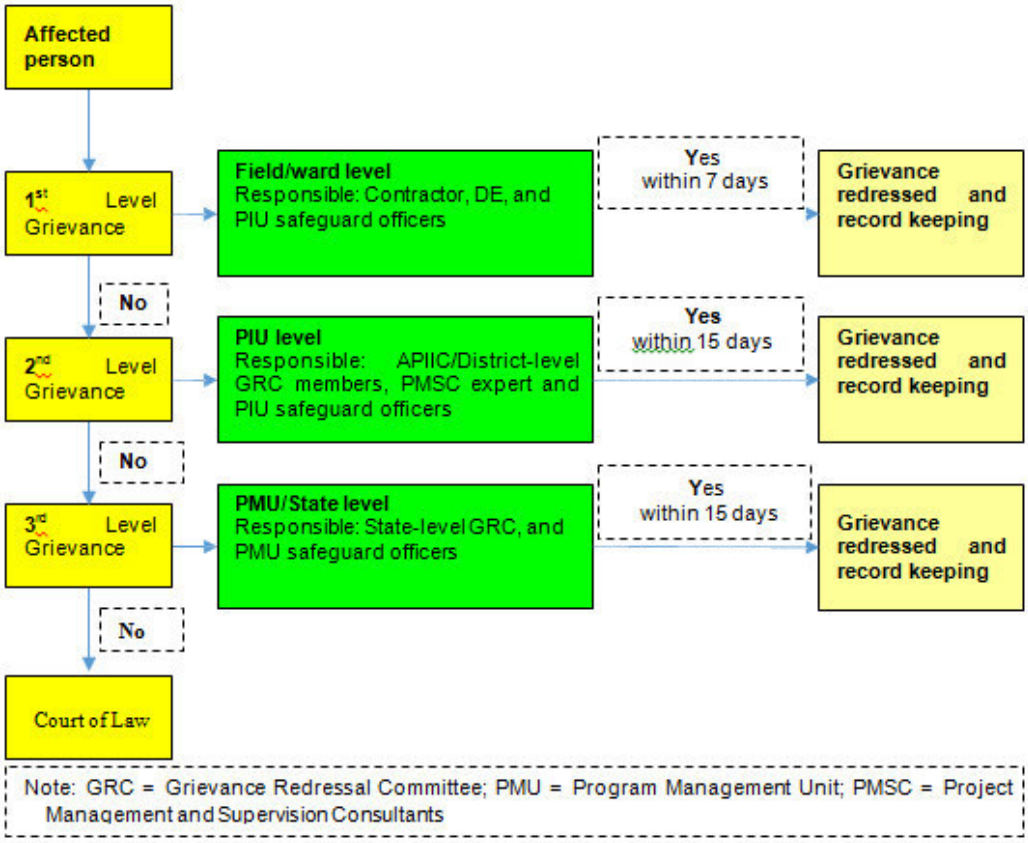


Figure 18: APIIC Grievance Redress Mechanism

## 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 17 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 17: Tentative PMU Structure

| Position | Tasks |
|---|---|
| ProjectDirector | OverallProjectManagement |
| ProjectDirector(Departmentof Industries) | Managementof land-relatedissues |
| ProcurementOfficer | Procurementof consultants,civilworks,goods,andNGOs,etc. |

| | |
|---|---|
| PMSC(SeniorEngineer) | Technicalofficerwithengineeringbackground andpreferablyexperienceofmultilateralprojects |
| InstitutionalCoordinationandPolicyReformsofficer | PolicyandInstitutionalsupport |
| InvestmentPromotionOfficer | Coordinationof VCICDPpromotion,marketing |
| MonitoringandEvaluationOfficer | Monitoringprojectresults |
| PMSC(EnvironmentalSafeguardsOfficer) | Environmentalsafeguardscompliance |
| PMSC(SocialSafeguardsandGenderOfficer) | Resettlementcompliance,social,gender |
| ChiefAccountantandFinancialManagementOfficer | Projectaccounting,auditandreporting |
| Accountant | Accounting |
| OfficeManager | Officemanagement |

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 18: APIIC Environmental Safeguard Officer Tasks and Responsibilities

| **APIICEnvironmental SafeguardOfficer** | **TasksandResponsibilities** |
|---|---|
| Senior Engineer Cum ComplianceOfficer–APIIC | (i) include IEEs/EMPs in bidding documents and civil works contracts;<br>(ii) reviewandapproveSEMPspreparedbycontractors;<br>(iii) overseeday-to-dayimplementationofSEMPsbycontractors includingcompliancewithallgovernmentrulesandregulations;<br>(iv) takenecessaryactionforobtainingrightsofway;<br>(v) overseeenvironmentalmonitoringbycontractors;<br>(vi) takecorrectiveactionswhennecessary;<br>(vii) submitmonthlyenvironmentalmonitoringreportstoPMU;<br>(viii) conduct continuous public outreach and awareness building relatedto environmentalmanagement;<br>(ix) addressgrievancesbroughtaboutthroughtheGRMinatimely manner;and<br>(x) organizeaninductioncourseforthetrainingofcontractorsin environmentalmanagementtobedeliveredbyPMSCconsultants |
| | (i) Ensure completepayment and other resettlementassistants. Providedtotheaffectedpeoplepriortodisplacements(physicaland economical)andstartsofcivil worksin theaffectedareas;<br>(ii) CoordinatewithSafeguardManagerof PMUand ensureall social/environmentalrequirementsifany aremet. |

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) (i) Update the IEEs including site- and subproject-specific EMP; (ii) Supervise EMP implementation;

(ii) 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

(iii) Prepare semi-annual environmental safeguards compliance reports.

(iv) Establish a system to monitor environmental safeguards of the Project; prepare indicators for monitoring important parameters of safeguards;

(v) 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;

(vi) Ensure that provisions and conditions of all necessary permits, consents, NOCs, etc., are incorporated in the IEEs;

(vii) Take proactive action to anticipate the potential environmental impacts of the Project to avoid delays in implementation;

(viii) Assist APIIC in the establishment of GRC for IEE implementation;

(ix) 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;

(x) Assist APIIC and PMU in the project GRM mechanism and complaint solution;

(xi) Assist APIIC and PMU for GRM record keeping for first tier complaint and redressed actions;

(xii) 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;

(xiii) 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;

(xiv) Provide on-the-job training programs to APIIC staff involved in Project implementation for strengthening their capacity in managing and monitoring environmental safeguards; and

(xv) 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 19: Institutional Roles & Responsibility: Environmental Safeguards

| **Phase** | **PMU /APIIC** | **PMSC** | **ADB** |
|---|---|---|---|
| Appraisal stage ofallSubproject under the investment program | PMU / APIICs to review the REA checklists and draft EIA/IEE. PMU/APIICstosubmit draft EIA/IEE toADBforreviewand approval. PMU/APIICstodiscloseonits websitetheapprovedEIA/IEE. PMU /APIICs to ensure disclosure of information throughoutthedurationofthe subproject. | PMSC to conduct REA foreachsubproject using checklistsandtoprepare EIA/IEE | ADB to review the REAchecklists and reconfirm the categorization. ADBwillreview and approve EIA reports (CategoryA)and IEE reports (Category B)subproject. ADBtodiscloseonits website thesubmitted EIA/IEEreport. |
| DetailedDesign Phase of all Subproject under the investment program | PMU/APIICs with the assistance of PMSC to incorporate the EMP, environmental mitigationand monitoring measuresinto contractdocuments. PMU / APIICs to obtain all applicable consents/permits/clearances PMUtosubmitto ADBfinalIEE | PMSCtorevisetheIEE andEMPinaccordance with detailed designchangesifwarranted . PMSC to ensure incorporationof EMP in bid documents and contracts. PMSC toprepare inventory ofutilitiestobe affected by | ADBwillreview and approve updated EIA reports (CategoryA)and IEE reports (Category B)subproject. ADBtodiscloseonits website updated EIA/IEEreport. |

| | | | |
|---|---|---|---|
| | forapprovalanddisclosureat ADBwebsite. | the subproject. | |
| Pre-construction Phase of all Subproject under the investment program | PMU /APIICstoconductpublic consultation anddisclosure during IEEprocessand comments willbereflectedin theIEEreport.<br>PMU/APIIC tomonitorthe disclosure andpublic consultation.<br>APIICand PMSC toapprove contractor‘s proposedlocations forconstruction workcamps, storage areas,hauling roads, laydownareas,disposal areas for solid and hazardous wastes.<br>PMUtosubmit toADBin prescribed formatsemi-annual EnvironmentMonitoringReport 6months afterLoaneffective date. | PMSC to ensure statutory clearancesand permitsfromgovernment agencies/other entities areobtained priortostart ofcivil works.<br><br>PMSC toensure disclosureof information priortostart ofcivilworks and throughout the durationof the constructionperiod.<br>PMSC to approve contractor‘ssite-specific environmentalplan(such as traffic management plan,wastemanagement plan,locationsforcamp sites,storageareas,lay down areas, and other sites/plans specified in theEMP).<br><br>PMSCto conduct baseline environmental conditions andinventory ofaffectedtrees | |
| Constructio n Phase of all Subproject Under the investment program | PMU/APIICswillreview 6-monthly monitoringandEMP implementationreportincludin g the status of Project compliance withstatutory clearances andwithrelevant loancovenantsandsubmitthe 6-monthly reporttoADBand seekpermissiontodisclosethe same in the investment programwebsite. | PMSC tomonitor the implementation of mitigation measures by Contractor.<br><br>PMSC to prepare monthlyprogressreports including a section on implementation of the mitigation measures (applicationof EMPand monitoringplan)<br><br>PMSC (asperEMP)will conduct environmental quality monitoringduring construction stage (ambient airandnoise, andwaterquality).<br><br>PMSCtoprepare thesix-monthlymonitoringreport onenvironment by focusing on the progress inimplementation ofthe EMP andissues encountered and measures adopted, follow-up actions required,ifany. | ADBtoreview the6 monthlyreport,provid e necessary advice if needed to the PMU andapprove the same.<br>ADBtodiscloseonits website environmental monitoringreports. |

| | | | |
|---|---|---|---|
| Pre-operation Phase (Commissioning andDefect LiabilityPeriod) | PMU / APIICs to review monitoring reportofPMSC on post-construction activitiesby thecontractorsasspecified in theEMP PMU/APIIC toreview applicable consents requirements | PMSC to apply for the CTOs priorto commissioning.<br>PMSC to monitorand approve post-construction activitiesby thecontractors as specifiedintheEMP. | |
| OperationPhase ofallSubprojects under the investment program | APIICstoconductmonitoring, As specified in the environmentalmonitoringplan. APPCB to monitor the compliance of the standards regarding drinking water quality,groundwater,ambient air, effluent quality from treatmentplant, noise, as applicable. | | |

Notes: APPCB = Andhra Pradesh State Pollution Control Board, PMSC = Project Management Supervision Consultants, CTE = Consent to Establish, CTO = Consent to Operate, 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 below.

Table 20: Training Program for Environmental Management

| Description | Contents | Schedule | Participants |
|---|---|---|---|
| **Pre-construction stage** | | | |
| Orientationworksh op | Module1–Orientation<br>- ADBSafeguardPolicy Statement<br>- Governmentof India EnvironmentalLawsand Regulations | 1/2day (atVijayawada) (50persons) | PMU,andAPIIC 's officialsinvolve din project implementation |
| **Description** | **Contents** | **Schedule** | **Participants** |
| | Module2–Environmental AssessmentProcess<br>- ADBenvironmental process,identificationof impacts andmitigationmeasures, formulationofanenvironmental managementplan(EMP), implementation,andmonitoring requirements-Reviewof environmentalassessment reportto complywith ADBrequirements<br>- Incorporationof EMP intotheprojectdesignand contracts | 1/2day (atVijayawada) (50persons) | PMU,andAPIIC's officialsinvolvedin project implementation. |
| **Constructionstage** | | | |
| Orientationprogra m/ workshopfor contractorsand supervisorystaff | - Rolesand responsibilitiesof officials/contractors /consultants towardsprotectionof environment-Environmental issuesduringconstruction<br>- Implementationof EMP<br>- Monitoringof EMPimplementation<br>- Reportingrequirements | 1 day (atSubproject locations) (15persons) | PMU APIICs Contractors |
| Experiencesand best practicessharin g | -ExperiencesonEMP implementation–issuesand challenges<br>- Bestpracticesfollowed | 1 dayonaregular periodtobe determinedby PMU,<br>APIICs,andPMSC (atHyderabad/ Vishakhapatnam) (50persons) | PMU APIICs Contractors |

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

## IX. ENVIRONMENTAL MANAGEMENT PLAN, MONTORING PLAN AND GRIEVANCE REDRESSAL MECHANISM

### 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 3)and site-specific Environmental Management Plan (SEMP)**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

(ii) India;

(iii) 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;

(iv) To stipulate monitoring and institutional requirements for ensuring safeguard compliance; and

(v) The CETPs 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) Toenhanceenvironmentalqualitythroughproperimplementationofsuggested mitigationmeasures.

(v) Tomeettherequirementsoftheexistingenvironmentalregulatoryframework and communityobligations.

## 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 4**. 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 $PM_{2.5}$, $PM_{10}$, CO, NOx and $SO_2$ 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 CETPs

**Ambient Air Quality (AAQ) Monitoring**: Ambient air quality parameters recommended for monitoring road development projects are $PM_{2.5}$, $PM_{10}$, Carbon Monoxide (CO), Oxides of Nitrogen (NOx) and Sulphur Dioxide ($SO_2$). 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 5**).

**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. Surface water quality will be monitored as per fresh water classification of CPCB (**Appendix 6**). The Indian Standard Specifications – IS10500: 1991 is given in Appendix 7.

**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 8**. 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 CETPs operations will be monitored.

## D. Environment Management Budget

The budget for carrying out environmental monitoring and associated trainings which shall be a part of contractor’s budget as given below.

| Sl No | Item | Unit Rate in INR | Frequency | Quantity | Total amount in INR |
|---|---|---|---|---|---|
| 1 | Air Quality Monitoring | 10,000 | 4 times in a year | 1.5 years and 1 location = 6 | 60,000 |
| 2 | Water Sampling | 5,000 | 4 times a year | 1.5 years and 1 location = 6 | 30,000 |
| 3 | Noise level testing | 1,500 | 4 times a year | 1.5 years and 1 location = 6 | 9,000 |
| 4 | Training and awareness | 50,000 | twice | 2 | 100,000 |
| **Total** | | | | | 199,000/- |

### E. Generic Guidelines for Implementing EMP

The reporting formats are given in Appendices 9 – 14.

## X. CONCLUSION AND RECOMMENDATION

128. The proposed subproject CETP at Naidupeta has been categorized as Category 'B'. This is based on the fact that a comprehensive EIA study for both the CETPs 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.

129. CETP is 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.

130. The significant environmental impacts attributable to the CETP pertain more to their operations phase relating to meeting statutory requirements for effluent handling and treatment, effluent discharge, hazardous waste management and final disposal to TSDF facilities. 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).

131. The initial environmental examination of the CETP subproject 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: APPCB – CFE – Approval of CETP design – Amendment to CFE Order – issued

ANDHRA PRADESH POLLUTION CONTROL BOARD
D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet, Vijayawada – 520010.
Phone: 0866 - 2436217
Website :www.appcb.ap.nic.in

**AMENDMENT TO CFE ORDER**

**Lr. No. 230 /PCB/CFE/RO-NLR/HO/2017** **Dt: 27.12.2018**

**Sub:** **APPCB – CFE – M/s. Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC), Konetirajupalem & Menakur Villages, Naidupet Mandal, SPSR Nellore District – Approval of CETP design – Amendment to CFE order - Issued - Reg.**

Ref:
1. Environmental Clearance dt. 26.02.2015 issued by MoE&F, GoI, New Delhi.
2. CFE order dt. 28.12.2016 issued by APPCB.
3. APIIC lr. dt. 28.08.2017.
4. APIIC lr. dt. 09.10.2018.
5. RO report dt. 30.10.2018.
6. CFE Committee meeting held on 05.11.2018.
7. APIIC lr. recd on 06.12.2018.

In the reference 1st cited the MoE&F, GoI, New Delhi issued EC to M/s. APIIC, MPSEZ, Naidupet. As per the conditions stipulated in the EC, a CETP of capacity 2.5 MLD has to be established to treat the effluents.

The Board issued CFE vide reference 2nd cited to M/s. APIIC, Naidupet to develop Multiproduct Special Economic Zone (MPSEZ). As per the conditions stipulated in the CFE order, CETP of capacity 2.5 MLD has to be established to treat the effluents. Further, a condition was stipulated that the proponent shall submit a time bound action plan to construct and commission the CETP to meet the requirements of industries.

M/s. APIIC vide referenced 3rd cited, informed that they would develop CETP in module wise and initially 1 MLD capacity would be developed. M/s. APIIC vide reference 4th cited, has informed that they have identified M/s. Ramky Enviro Engineers Ltd as the contractor to setup the CETP and the contractor has submitted design details of the CETP. In this regard, M/s. APIIC has submitted the site plan along with the design details for approval of APPCB.

The EE, RO: Nellore submitted report in this regard vide reference 5th cited.

The issue was placed before the CFE Committee meeting held on 05.11.2018. The proponent vide reference 7th cited has informed as following:

a) Separate CETPs are planned for MPSEZ, Naidupeta, IP Naidupeta and IP Attivaram. Treating the waste water from all the three above mentioned industrial areas in the proposed 1.0 MLD CETP module is for meeting the immediate needs of all three Industrial Parks, where occupancy is less at present. Separate CETP modules in all the three industrial areas will be taken up as and when the demand arises on establishment of industrial units in these parks.

b) Submitted revised design report of the CETP based on the observations in the agenda of the CFE Committee.

The Board, after careful scrutiny of the revised details of CETP, report of the Regional Officer, recommendations of the CFE Committee hereby issues **AMENDMENT TO CONDITION No: 15 under Schedule –B of CONSENT FOR ESTABLISHMENT issued vide reference 2nd cited** to your activity under Section 25 of Water (Prevention & Control of Pollution) Act 1974 and Section 21 of Air (Prevention & Control of Pollution) Act, 1981 and the rules made there under, with the following conditions:

- The CETP of capacity 1.0 MLD shall be established in the 1st module to meet the requirements of units in the MPSEZ, Naidupeta, IP Naidupeta and IP Attivaram.
- Separate CETP modules are to be constructed in all the three industrial parks in future.
- Separate treatment units are to be established for Cyanide and Chromium removal, HTDS and LTDS effluents.
- The Cyanide and Chromium (Acidic 50 cum/day + Alkaline 50 cum/day) removal system consists of Oil & Grease trap, equalization tank, Reaction tanks 1 & 2, Settling tank.
- HTDS effluents (170 KLD) treatment consists of Bar screen, grit trap, oil and grease trap, equalization tank, flash mixing tank, flocculation tank, settling tank, stripper, MEE, ATFD. MEE salts shall be sent to TSDF. MEE condensate shall be sent to LTDS ETP.
- LTDS effluents (830 KLD) treatment consists of Bar screen, grit trap, oil and grease trap, equalization tank, flash mixing tank, flocculation tank, primary clarifier, Balancing tank, MBBR, extended aeration tank, secondary clarifier, CCT, pressure sand filter and activated carbon filter, intermediate sump, Flash mixture 3, Tertiary clarifier, treated waste water collection sump, ultra filtration, reverse RO plant. Centrifuge and filter press, Sludge thickener, Sludge sump. RO permeate is reused. RO rejects are send to MEE.

- All the units of the CETP shall be impervious to prevent ground water pollution.
- All the effluent storage tanks & treatment units shall be constructed above ground level.
- Magnetic flow meters shall be installed at the inlet and out lets of Stripper, MEE, ETP, RO plant. The flow meters are to be connected to the web site of APPCB.
- Guard ponds of capacity 3 to 5 days shall be constructed as stipulated in the CFE order.
- Continuous on-line monitoring system shall be installed to monitor the treated effluents after the guard ponds before releasing into the sea through the marine outfall. It should be connected to the website of APPCB and CPCB as per the directions of CPCB.
- The green belt shall be developed along the boundary of the CETP.
- **All other conditions stipulated in the CFE order dt. 28.12.2016 shall remain the same.**

VIVEK YADAV
Digitally signed by VIVEK YADAV
Date: 2018.12.27 21:54:39 +05'30'

**MEMBER SECRETARY**

**To**

**The Vice Chairman & Managing Director,**
**Andhra Pradesh Industrial Infrastructure Corporation (APIIC),**
**D.No. 59A-20-3-2A, 1st, 2nd, and 3rd Floors,**
**Sri Siva Complex, Funtimes Club Road,**
**Teachers Colony, Vijayawada-520 008.**

**Copy to:**

1. The JCEE, Z.O: Vijayawada for information and necessary action.
2. The E.E., R.O: Nellore for information and necessary action.

## Appendix 2: Government order no GO.RT.No. 163 dated 08-06-2018 for establishment of Grievance Redressal Mechanism

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

VCICDP - Establishment of Project Grievance Redress Mechanism (GRM) at three levels to cover both environmental and social issues - Orders - Issued.

==========

INDUSTRIES AND COMMERCE (INFRA) DEPARTMENT

G.O.RT.No. 163 Dated: 08-06-2018

Read the following:

1. Facility Administrative Manual (FAM) of VCICDP.
2. From the Commissioner of Industries, Vijayawada, 15/1/2014/11427/VCIC-GRM, Dated:31-05-2018

&&&

ORDER:

In the reference 2nd read above, the Commissioner of Industries has stated that at Sl. No. 95, Page No. 42 of the Facility Administrative Manual of the VCICDP, the Project Grievance Redress Mechanism (GRM) is envisaged, wherein, it is directed to establish Project GRM at three levels to cover both Environmental and Social issues.

2. The Commissioner of Industries has proposed for establishment of Project Grievance Redress Mechanism at three levels with the following provisions and requested the Government to take a view on the establishment of Project GRM and issue orders:-

a. The GRM shall be established and disclosed to the project affected communities.
b. The Project Grievance Redress Committee, supported by the consultants of PMSC and Safeguard officers of both the PMU and PIUs, will be responsible for timely redress of grievances on Environmental and Social Safeguards issues.
c. The Grievance Redress Committee is also responsible for Registration of Grievances, Related Disclosure and Communication with the aggrieved parties.
d. A complaint register shall be maintained at the field unit, PIU and PMU levels with details of 1. Complaint lodged, 2. Date of Personal Hearing, 3. Action Taken and 4. Date of communication sent to the complainant.
e. Contact Details, Procedure and Complaint Mechanism shall be disclosed to the Project Affected Communities at accessible locations and through various Media (Leaflets, Newspapers etc.,)

3. Government after careful examination of the proposal, hereby establish the Project Grievance Redress Mechanism at three levels is as follows:-

**1st Level Grievance:**

The Contact Number of the PIU office should be made available at the construction site signboards. The contractor and field unit staff can immediately resolve onsite, seek the advice of the PIU Safeguard Manager as required, within seven (7) days of receipt of the complaint / grievance.

**2nd Level Grievance:**

All grievances that could not be redressed within seven (7) days at Field / Ward level shall be reviewed by the GRC at District Level headed by Joint Collector of the respective District. GRC shall attempt to resolve them within fifteen (15) Days. The Safeguard Manager of the PIU shall be responsible to see through the process of redressal of each grievance.

(P.T.O)

**3rd Level Grievance:**

All grievances that cannot be redressed within fifteen (15) days at District Level shall be reviewed by the Grievance Redressal Committee (GRC) at State Level headed by the Project Director, VCICDP PMU, with support from District GRC, PMU, Social Safeguards and Gender Officer (SSGO), Environmental Safeguard Officer of PMU. Environmental and Social Safeguard Specialists of PMSC shall coordinate the GRC to ensure that the grievances be resolved within fifteen (15) days. The SSGO of PMU shall be responsible to see through the process of redressal of each grievance pertaining to the Social Safeguards

4. Government hereby constitute the Grievance Redressal Committee (GRC) at District level with the following composition:

| | | |
|---|---|---|
| 1. | Joint Collector of the Concerned District | Chairman |
| 2. | Project Engineer of the concerned field unit | Member Secretary |
| 3. | Revenue Divisional Officer (RDO) or sub-collector of the division | Member |
| 4. | Project Director, DRDA | Member |
| 5. | Chief Executive Officer, Zilla Parishad | Member |
| 6. | District Panchayat Officer | Member |
| 7. | District Education Officer | Member |
| 8. | District Medical and Health Officer | Member |
| 9. | District level representative of DISCOM | Member |
| 10. | Superintendent Engineer, RWS Panchayat Raj Department | Member |
| 11. | Three members from affected persons, with at least one of them a woman DP | Member |
| 12. | Team Leader of the resettlement plan implementation support NGO or Agency | Member |

5. The functions of the Grievance Redressal Committee (GRC) at District level are as follows:

a) GRC at District Level shall receive, evaluate and facilitate the resolutions of displaced person's concerns, complaints and grievances.
b) The GRC shall provide an opportunity to the affected persons to have their grievances redressed prior to approaching the State Level LARR Authority, constituted by the GoAP in accordance with Section 51 (1) of the RFCTLARR Act, 2013.
c) 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 displaced person's concerns without allowing it to escalate resulting in delays in project implementation.
d) The GRC shall meet once in every month and review and redress any grievances / complaints. Periodical monthly reports shall be submitted to the Project Director, VCICDP PMU in the prescribed proforma.

//Countd.p.3//

e) The GRC will continue to function, for the benefit of the displaced persons, during the entire life of the project including the defects liability period. The entire resettlement component of the project has to be completed before the construction starts, and pending grievances resolved. Other than disputes relating to ownership rights and apportionment issues on which the LARR Authority has jurisdiction.
f) GRC will review grievances involving all resettlement benefits, relocation and payment of assistances.
g) The GRCs will function out of each district where the subprojects are being implemented. The existing setup for coordination, monitoring and grievance redress at district level which meets once a month, will be used for VCICDP.
h) An annual fund of Rs.1.00 Lakhs shall be allocated to each GRC for their operations like convening monthly review meetings, preparing and distributing broachers, leaflets etc.

6. The Project Director, PMU, VCICDP shall be the Appellate Authority and shall be supported by the Safeguards Officer of PMU, VCICDP and the Team Leader of PMSC. This shall be the highest Grievance Redressal Mechanism at the project level.

7. The Project Monitoring Unit (PMU), Project Implementing Units (PIUs) and Grievance Redressal Committees (GRCs) shall update the status of complaints / grievances in the VCIC Web-Site.

5. The Project Director, PMU, VCICDP shall take further necessary action in the matter, accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

S.SOLOMON AROKIARAJ
SECRETARY TO GOVERNMENT & CIP

To
The Project Director, Project Monitoring Unit, VCICDP, Vijayawada.
The Chairman and all the members through PD, PMU, Vijayawada.
Copy to:
The District Collectors, Visakhapatnam, East Godavari, Krishna and SPS Nellore.
P.S. to Minister for Industries
P.S. to Prl. Secretary to CM (GSP)
Sc/Sf

//FORWARDED BY: ORDER//

SECTION OFFICER

**Appendix 3: Environmental Management Plan**

**ENVIRONMENTAL MANAGEMENT PLAN**

| S.No. | Environmental Issue | Location/sources | MitigationMeasures | Implementing Agency | Supervising& MonitoringAgency |
|---|---|---|---|---|---|
| **PRE-CONSTRUCTIONPHASE** | | | | | |
| 1 | EIAApproval | Undertakeallnecessary Requirementstoobtain EIAapprovalfor NaidupetaCETP | • Necessary planning and Coordination with concerned authorities<br>• Prior notice to and consultation withconcerned authority,publictobeaffectedsoas to ensure that work does not get affected. | APIIC | APPCB/MoEF |
| 2 | Contractor Preparatory Works | | TheContractorwillcomplete the followingactivitiesnolaterthan30 days upon issuance of Notice to Proceed<br>1.)Submitappointment letterand resume of theContractor's Environmental Officer(EO)to SC/APIIC<br>2.) EO will engage CSC- Environment Specialisandtoa meetingtodiscussindetailthe EMP, seekclarification andrecommend correspondingrevisionsifnecessary<br>3.)EOwillrequestCSC-ES copy of monthly monitoring formatsand establishdeadlinesforsubmission.<br>4.)EOwillsubmit forCSC-ES approval anaction plantosecureall permitsandapprovals neededtobe securedduringconstruction stage whichinclude butnotlimited to:i) Agreement with TSDFfortransport, storageanddisposal ofhazardous | Contractor | APIIC |

| S.No. | Environmental Issue | Location/sources | MitigationMeasures | Implementing Agency | Supervising& MonitoringAgency |
|---|---|---|---|---|---|
| | | | waste (e.g.sludge, toxicuntreated wastewater), ii)temporarystorage location, iii) water use, and iv) emissionandfitnesscomplianceof allvehiclestobeusedforhazardous wastetransfertoCETPs. | | |
| **CONSTRUCTIONPHASE** | | | | | |
| 1 | Air Pollution | Constructionplants, equipmentandvehicles | | Contractor | APIIC |
| | | Dustduringearth works | • Maintaining adequate moisture atsurfaceofanyearthwork layercompleted ornon-completed unlessanduntilbasecourse is applied,toavoiddustemission.<br>• Stockpilingspoil at designated areasandatleast5m awayfrom trafficlane. | Contractor | APIIC |
| | | Storageofconstruction materials | • Sprinklingofwateras necessary. | Contractor | APIIC |
| 2 | WaterPollution | Constructionof CETPfoundation, storagetanks, Earthworkandmarginal spillageof construction materialscausing temporaryturbidity andsuspendedsolids | Storageofconstructionmaterialand excavatedsoilabovehighfloodlevel | Contractor | APIIC |
| | | Constructionvehicles | •Strictlyavoidingcleaning/washing ofconstructionvehicleinanywater body | Contractor | APIIC |
| | | Soil erosion from constructionsite | • Proper planning of site clearingandgrubbing soasnotto keepthecleared sitebeforeworking forlongduration.<br>• Providing temporary side drains, catchwaterbankordrains, sedimentationbasin,as necessaryto avoidorminimize erosionand | Contractor | APIIC |

| S.No. | Environmental Issue | Location/sources | MitigationMeasures | Implementing Agency | Supervising& MonitoringAgency |
|---|---|---|---|---|---|
| | | | preventsedimentation toreceiving waterbodies | | |
| 3 | Groundwater pollution | Wastewaterlogging | •Allwastewaterwillbedivertedtoa ditchthat will be managedfor the periodofconstruction andafter construction such ditches will be filledandrestored tooriginal condition. | Contractor | APIIC |
| | | Humanwastesand wastewater | • Providingseptictanksfor treatingsewagefrom toiletsbefore dischargingthroughsoakpits<br>• Decantingandorcontrolled disposalofoilandgreaseas collectedatcollectiontanksof maintenanceyardandchemical storageareas | Contractor | |
| 4 | Noise Pollution andVibration | Vehiclesand Constructionmachinery | • **Protection devices** (ear plugsorearmuffs)willbeprovided to the workers operating in the vicinity ofhighnoisegenerating machines.<br>•Constructionequipmentand machinery shouldbefittedwith silencersandmaintainedproperly.<br>• Source-control through proper maintenance of all equipment.<br>• Use of properly designed engine enclosures andintake silencers.<br>• Noisemeasurements should becarried outalongtheroadto ensure the effectiveness of mitigationmeasures.<br>• Vehicles and equipment used should confirm to the | Contractor | 4 |

| S.No. | Environmental Issue | Location/sources | MitigationMeasures | Implementing Agency | Supervising& MonitoringAgency |
|---|---|---|---|---|---|
| | | | prescribednoisepollutionnorms. | | |
| 5 | LandPollution | Spillage from plant and equipment at constructioncamp | • Providing impervious platformandoilandgreasetrap for collection of spillagefrom construction equipmentvehicle maintenance platform<br>• Collection oil and lubes drips in container during repairing construction equipment vehicles<br>• Providing impervious platform and collection tank for spillage of liquid fuel and lubes at storage area | Contractor | APIIC |
| | | Domesticsolidwaste Andliquid Wastegeneratedat camp | • Collecting kitchen waste at separatebinsanddisposingofin a pitat designatedarea/s<br>• Collecting plastics in separatebinsanddisposing in deeptrenchatdesignatedarea/s coveringwithsoil<br>• Collecting cottons, clothes etc.atseparateinsandburningina pit(withsandbed) | Contractor | APIIC |
| 6 | Occupational healthand safetyof workers | Constructioncamp | • Watersupply,sanitation, drainageandmedicalhealth facilitiesatcampsite<br>• ProvidingandusingPPEs<br>• Usingworkingreversehorn forallconstructionequipmentand vehicles | Contractor | APIIC |
| 7 | Accidentsand safety | Constructionsites | •Providing adequate light at construction zone if working duringnighttimeispermitted by theEngineer | Contractor | APIIC |

| S.No. | Environmental Issue | Location/sources | MitigationMeasures | Implementing Agency | Supervising& MonitoringAgency |
|---|---|---|---|---|---|
| | | | •Conducting induction and periodic training for all workers andsupervisors | | |
| **Operation Stage** | | | | | |
| 1 | Pollution | At the CETP Plan | Disposal of sludge in designated area or through APPCB recognized agency | Operator / APIIC | APIIC |
| 2 | Air Quality | At the CETP Plan | Measures to mitigate air pollution from DG set and fugitive emission form the incoming influents from industries | Operator / APIIC | APIIC |
| 3 | Water Quality | At the CETP Plan | Effluent and ground water | Operator / APIIC | APIIC |
| 4 | Ground Water Quality | At the CETP Plan | Effluent and ground water | Operator / APIIC | APIIC |
| 5 | Occupational Health and safety | At the CETP Plan | Measure will be provided as per best international practices like IFC/World Bank EHS guidelines | Operator / APIIC | APIIC |

**Appendix – 3(a) Site Specific Environmental Management Plan**

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| Design Phase / Pre-construction Stage | | | | | | | |
| EIA Approval | •Necessary planning and Coordination with concerned authorities<br>• Prior notice to and consultation with concerned authority, public to be affected so as to ensure that work does not get affected. | Environmental clearance has been obtained for the | All project site | APIIC | Document check | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| Contractor Preparatory Works | The Contractor will complete the following activities no later than 30 days upon issuance of Notice to Proceed<br>1.) Submit appointment letter and resume of the Contractor's Environmental Officer (EO) to SC/APIIC<br>2.) EO will engage CSC- | The identified items are being prepared. | All project site | APIIC / Contractor | Document check | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | Environment Special is and to a meeting to discuss in detail the EMP, seek clarification and recommend corresponding revisions if necessary<br><br>3.) EO will request CSC-ES copy of monthly monitoring formats and establish deadlines for submission.<br><br>4.)EO will submit for CSC-ES approval an action plan to secure all permits and approvals needed to be secured during construction stage which include but not limited to: i) Agreement with TSDF for transport, storage and disposal of hazardous waste (e.g. sludge, toxic untreated wastewater), ii) temporary storage location, iii) water use, | | | | | | |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | and iv) emission and fitness compliance of all vehicles to be used for hazardous waste transfer to CETPs. | | | | | | |
| **Construction Stage Site specific Environmental Management Plan** | | | | | | | |
| Air Pollution | • Maintaining adequate moisture at surface of any earth work layer completed or non-completed unless and until base course is applied, to avoid dust emission.<br>• Stock piling spoil at designated areas and at least 5m away from traffic lane. | Air quality monitoring is being done the contractor construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| | Sprinkling of water as necessary | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | | | | | | | quarterly |
| Water Pollution | Storage of construction material and excavated soil above high flood level | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| | •Strictly avoiding cleaning/washing of construction vehicle in any water body | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| | • Proper planning of site clearing and grubbing so as not to keep the cleared site before working for long duration.<br>• Providing temporary side drains, catch water bank or drains, sedimentation basin, as necessary to avoid or minimize erosion and prevent sedimentation to | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | receiving water bodies | | | | | | |
| Groundwater pollution | •All waste water will be diverted to a ditch that will be managed for the period of construction and after construction such ditches will be filled and restored to original condition. | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| | Providing septic tanks for treating sewage from toilets before discharging through soak pits<br>• Decanting and or controlled disposal of oil and grease as collected at collection tanks of maintenance yard and chemical storage areas | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| Noise Pollution and Vibration | • Protection devices (ear plugs or earmuffs) will be provided to the workers operating in the vicinity of high noise generating | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | machines.<br>• Construction equipment and machinery should be fitted with silencers and maintained properly.<br>• Source-control through proper maintenance of all equipment.<br>• Use of properly designed engine enclosures and intake silencers.<br>• Noise measurements should be carried out along the road to ensure the effectiveness of mitigation measures.<br>• Vehicles and equipment used should confirm to the prescribed noise pollution norms. | | | | | | quarterly |
| Land Pollution | • Providing impervious platform and oil and grease trap for | It will be done during the construction | All places of construction site and air | Contractor | Laboratory testing and visual | APIIC/ PMU/ PMSC | Contractor to Monitor regularly |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | collection of spillage from construction equipment vehicle maintenance platform<br>• Collection oil and lubes drips in container during repairing construction equipment vehicles<br>• Providing impervious platform and collection tank for spillage of liquid fuel and lubes at storage area | stage | quality monitoring is | | inspection | | APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| | Collecting kitchen waste at separate bins and disposing of in a pit at designated area/s<br>• Collecting plastics in separate bins and disposing in deep trench at designated area/s covering with soil<br>• Collecting cottons, clothes etc. at separate in sand burning in a pit(with | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | sand bed) | | | | | | |
| Occupational health and safety of workers | • Water supply, sanitation, drainage and medical health facilities at campsite<br>• Providing and using PPEs<br>• Using working reverse horn for all construction equipment and vehicles | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| Accidents and safety | •Providing adequate light at construction zone if working during night time is permitted by the Engineer<br>•Conducting induction and periodic training for all workers and supervisors | It will be done during the construction stage | All places of construction site and air quality monitoring is | Contractor | Laboratory testing and visual inspection | APIIC/ PMU/ PMSC | Contractor to Monitor regularly<br>APIIC to inspect monthly<br>PMSC/ PMU to inspect quarterly |
| **Operation Stage Site Specific Environmental Management Plan** | | | | | | | |
| Air Quality | Measures to mitigate air pollution from DG set and | All parameters as per the | Near the CETP | Contractor in DLP and APII | Laboratory | APIIC/ Operator | Once in a year |

| Impacts (List from IEE) | Mitigation Measures (List from IEE) | Parameters to be Monitored | Location | Responsible for mitigation | Monitoring Method | Responsible for Monitoring | Frequency of Monitoring |
|---|---|---|---|---|---|---|---|
| | fugitive emission form the incoming influents from industries | National Ambient Air Quality Parameters | | or operator | test | | |
| Water Quality | Effluent and ground water | Physical and chemical parameters | Near the CETP | Contractor in DLP and APII or operator | Laboratory test | APIIC/ Operator | Once in a year |
| Ground Water Quality | Effluent and ground water | Physical and chemical parameters | Near the CETP | Contractor in DLP and APII or operator | Laboratory test | APIIC/ Operator | Once in a year |
| Occupational Health and safety | Measure will be provided as per best international practices like IFC/World Bank EHS guidelines | Availability of PPE and other occupational safety measures | Near the CETP | Contractor in DLP and APII or operator | Laboratory test | APIIC/ Operator | Once in a year |

**Appendix 4: Environmental Monitoring Program**

**Table 1: ENVIRONMENTAL MONITORING PLAN**

| Component | Project Stage | | MONITORING | | | | | RESPONSIBILITY | |
|---|---|---|---|---|---|---|---|---|---|
| | | Parameters | Measurement Method | Standards | Location | Frequency | Duration | Implementation | Supervision |
| **Air** | Construction Stage | PM2.5 PM10 SO2 $NO_x$ CO | Methodsof Measurement asprescribed inNational AmbientAir Quality Standard **(Appendix 5)** | National Ambient Quality Standards **(Appendix 5)** | Nextto construction area | Oncea quarter | once | Contractor through approved monitoring agency | APIIC |
| | Operation Stage | Sameas above | Sameas above | Sameas above | 2 locations nextto CETP holding tanks and outside boundary | Asper Statutory requirementsand Environmental Clearance conditions. (asstated in EIA'sof Naidupetaindustrial estate) | Asper Statutory requirementsand Environmental Clearance conditions.(as statedin EIA'sof Naidupetaindustrial estate) | APIICthrough approved monitoring agency | APIIC |
| **Water Quality** | Construction stage (surface water) | pH, temperature, turbidity, DO, BOD,COD, TDS,TSS, Oil& Grease | Grabsample collectedfrom sourceand analyzedas perIS:2488 (Part1-5) methodsforsampling and testing of Industrial effluents | Water quality standards by CPCB **(Appendix 6)** | 1 location | Onceina Quarterfor 3 years | - | Contractor through approved monitoring agency | APIIC |
| | Construction stage (ground | All parameters Ofdrinking water | | IS: 10500, 1991 (Appendix 7) | 1 location | halfyearly for 3years | - | Contractor through approved monitoring | APIIC |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | water) | | | | | | | agency | |
| | Operation Stage (surface water) | pH, temperature, turbidity, DO, BOD, COD, TDS, TSS, Oil & Grease and Pb | Grab sample collected from source and analyzed as per IS : 2488 (Part 1-5) methods for sampling and testing of Industrial effluents | Water quality standards by CPCB | As per Statutory requirements and Environmental Clearance conditions. (as stated in EIA's of Naidupeta industrial estate) | As per Statutory requirements and Environmental Clearance conditions. (as stated in EIA's of Naidupeta industrial estate) | - | APIIC through approved monitoring agency | APIIC |
| **Noise levels** | Construction 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 8) | Once a quarter | | | Contractor through approved monitoring agency | APIIC |
| | 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 8) | Once a quarter | | | APIIC through approved monitoring agency | APIIC |
| **Hazardous Waste (Sludge)** | Operation stage | AS defined by waste characteristics | As defined by waste characteristics | As per Environmental Clearance requirements | As per Environmental Clearance requirements (Hazardous Waste &Management Rules, | As per Environmental Clearance requirements | As per Environmental Clearance requirements | Contractor | APIIC |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2008) and subsequentamendments | | | | |
| **Occupational Health & Safety** | Operation stage | As defined by waste characteristic s and worker profile | As defined by waste characteristics and worker profile | As per Environmen t al Clearance requirements | As per Environmental Clearance requirements | As per Environment al Clearance requirement s | As per Environmental Clearance requirements | Contractor | APIIC |

**Appendix 5: National Ambient Air Quality Standards**

| **Pollutant** | **Time weighted average** | **Sensitive area** | **Industrial area** | **Residential, rural&other areas** | **Methodofmeasurement** |
|---|---|---|---|---|---|
| Sulphur Dioxide(SO2) | Annual*<br>24hours** | 15µg/m³<br>30µg/m³ | 80µg/m³<br>120µg/m³ | 60µg/m³<br>80µg/m³ | Improved West and Gaeke MethodUltraviolet Fluorescence |
| Oxides of Nitrogenas NOx | Annual*<br>24hours** | 15µg/m³<br>30µg/m³ | 80µg/m³<br>120µg/m³ | 60µg/m³<br>80µg/m³ | Jacab&Hochheiser Modified (Na-Arsenite) methodGas phase Chemiluminescence |
| Suspended Particulate Matter(SPM) | Annual*<br>24hours** | 70µg/m³<br>100µg/m³ | 360µg/m³<br>500µg/m³ | 140µg/m³<br>200µg/m³ | High Volume Sampler (Average flow rate not less than1.1m³/minute) |
| Restorable Particulate Matter (RPM) sizelessthan 10µm | Annual*<br>24hours** | 50µg/m³<br>75µg/m³ | 120µg/m³<br>150µg/m³ | 60µg/m³<br>100µg/m³ | Respirable Particulate MatterSampler |
| Pollutant | Time weighted average | Sensitive area | Industrial area | Residential, rural & other areas | Methodofmeasurement |
| Lead(Pb) | Annual*<br>24hours** | 0.5µg/m³<br>0.75µg/m³ | 1.0µg/m³<br>1.5µg/m³ | 0.75µg/m³<br>1.0µg/m³ | AASMethod aftersampling usingEPM 2000orequivalent filterpaper |
| Carbon Monoxide (CO) | 8 hours**<br>1 hour | 1.0mg/m³<br>2.0mg/m³ | 5.0mg/m³<br>10mg/m³ | 2.0mg/m³<br>4.0mg/m³ | Non-dispersiveinfrared Spectroscopy |

## Appendix 6: Guidelines of CPCB on Primary Water Quality

| DesignatedBestUse | Class of Water | Criteria |
|---|---|---|
| Drinkingwatersource (withconventional treatment) | A | TotalColiformsMPN/100ml shallbe50orlesspHbetween6.5 to8.5<br>DissolvedOxygen6mg/1ormore<br>BiochemicalOxygenDemand(BOD)5days20°C2mg/1or less |
| Outdoor bathing (organised) | B | TotalColiformsMPN/100mlshallbe500or lesspHbetween6.5 to8.5<br>DissolvedOxygen5mg/1ormore<br>BiochemicalOxygenDemand(BOD)5days20°C3mg/1or less |
| Drinking WaterSource (withoutconventional treatment) | C | TotalColiformsMPN/100mlshallbe5000orlesspHbetween 6.5to8.5<br>DissolvedOxygen4mg/lor more<br>BiochemicalOxygenDemand(BOD)5 days20°C3mg/lorless |
| PropagationofWildlife | D | pHbetween6.5to8.5forFisheriesDissolvedOxygen4mg/lor more<br>FreeAmmonia(asN)1.2mg/lorless |
| Irrigation, IndustrialCooling,ControlledWaste | E | pHbetween6.0to 8.5<br>ElectricalConductivityat25°CMax2250µmhos/cm<br>SodiumabsorptionratioMax.26<br>Boron,Max.2mg/l |

**Appendix 7: 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 8: National Ambient Noise Standards

| AreaCode | CategoryofZones | LimitsofLeqindB(A) | |
|---|---|---|---|
| | | Daytime* | Nighttime* |
| A | Industrial | 75 | 70 |
| B | Commercial | 65 | 55 |
| C | Residential | 55 | 45 |
| D | SilenceZone** | 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 9: 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:** VCICDP-APIIC CETP subproject

**Sector Division:** South Asia Urban Development Division

| **ScreeningQuestions** | **Yes** | **No** | **Remarks** |
|---|---|---|---|
| B. Project Siting<br>Is the project area | | | |
| • Denselypopulated? | | ✓ | The industrial estates are far from the urbancityandhencepopulationisless. |
| •Heavywithdevelopmentactivities? | ✓ | | Asandwhenmoreindustrieswillcome up,theactivityintheareawill 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 | | ✓ | |
| Mangroves | | ✓ | |
| Estuaries | | ✓ | |
| Buffer zone of protected area | | ✓ | |
| Special area for protecting biodiversity | | ✓ | |
| Bay | | ✓ | |
| A. Potential Environmental Impacts Will the Project cause | | | |
| Impairmentof historical/cultural monuments/areasandloss/damageto | | □ | Notanticipated |

| | | | |
|---|---|---|---|
| thesesites? | | | |
| Interferencewithotherutilitiesand blockingofaccesstobuildings; nuisancetoneighboringareasdueto noise,smell,andinfluxofinsects, rodents,etc.? | | ✓ | Notanticipated |
| Dislocationor involuntaryresettlement ofpeople? | | ✓ | Notanticipated |
| • Disproportionateimpactsonthepoor, womenandchildren,IndigenousPeoplesorothervulnerablegroups? | | ✓ | Notanticipated. |
| • Impairmentofdownstreamwater qualityduetoinadequatesewage treatmentorreleaseof untreated sewage? | **Y** | | ForindustrialeffluentfromCETP.<br>NotanticipatedforNaidupetaCETPasit isdesignedasZeroDischarge Liquid (ZLD). |
| • overflowsandfloodingofneighboring propertieswithrawsewage? | | ✓ | Notanticipated. |
| • Environmental pollutiondueto inadequatesludgedisposalorindustrialwastedischargesillegally disposedinsewers? | | ✓ | Notanticipated.Drainagesystemsofthe Economiczonesaredesigned tobe separate fromindustrialeffluents.The EMPensuresmeasures areincludedto mitigatetheimpacts. |
| • noiseandvibrationduetoblastingand othercivilworks? | | ✓ | Notanticipated. |
| • risksandvulnerabilitiesrelatedto occupationalhealthandsafetydueto physical,chemical,andbiological hazardsduringprojectconstructionandoperation? | | ✓ | Not anticipated. Workers may getexposed todustandnoiseduring construction activities.Howeverthe exposurelevelsarelikely tobeshortand insignificant. Workerswillbeprovided requisitePPEs tominimisesuch exposure andassociated harmful occupational healtheffects.TrafficSafetymeasureswill beadoptedduringoperationphase. |
| • dischargeofhazardousmaterialsinto sewers,resultingin damagetosewersystemanddangertoworkers? | | ✓ | Notanticipated.Drainagesystemsoftheeconomiczonesaredesigned tobe separate fromindustrialeffluents.The EMPensuresmeasures areincludedto mitigatetheimpacts. |
| • inadequatebufferzonearound pumpingandtreatmentplantsto alleviatenoiseandotherpossiblenuisances,andprotectfacilities? | | ✓ | Notanticipated. |
| • roadblockingandtemporaryflooding duetolandexcavation during therainyseason? | | ✓ | Notanticipated. |
| • noiseanddustfrom construction activities? | ✓ | | Ambient noise level is expected toincreasein the rangeof80-90dB(Aa)due tovariousconstruction activities, maintenanceworkshops,andearthmoving equipment. Howeverthere are no sensitive receptors in the economic zones.Nevertheless, stationarynoise- making sources equipment like dieselgenerator sets and compressors will be installed with acoustic enclosures. Workers will be required to wear PPEs and exposure to noise will be limited asper EHS Guidelines. |

| | | | |
|---|---|---|---|
| • Trafficdisturbancesduetoconstruction materialtransportand wastes? | | □ | Not anticipated. Construction works arewithinthe economic zones. Transportation routes will be through existing roads built for use of the economic zones. |
| • temporarysiltrunoffdueto construction? | | ✓ | Notanticipated. |
| • hazardstopublichealthdueto overflowflooding,andgroundwater pollutionduetofailureofsewerage system? | | ✓ | Notanticipated. |
| • Deteriorationofwaterqualitydueto inadequatesludgedisposalordirect dischargeofuntreatedsewagewater? | | ✓ | Notanticipated. |
| • contaminationofsurfaceandground watersduetosludgedisposalon land? | | ✓ | Not anticipated. CETP designs include sludge management. TheEMPensures measures areincluded tomitigatethe impacts. |
| • healthandsafetyhazardstoworkers from toxicgasesandhazardous materialswhichmaybecontainedin confinedareas,sewageflowand exposuretopathogensinuntreated sewageandun-stabilizedsludge? | | ✓ | Not significant.Adequate PPE's will be provided toworkersonsite.Regular monitoring andtesting ofair,waterand sludgequality willbeconducted asalso mentioned in the monitoring schedule. TheEMPensures measuresareincluded tomitigatethe impacts. |
| • largepopulationincreaseduringproject constructionandoperationthatcauses increasedburdenonsocial infrastructure(suchassanitation system)? | | ✓ | Notanticipated. |
| • socialconflictsbetweenconstruction workersfrom otherareasandcommunityworkers? | | ✓ | Not Anticipated. Local workers will be employedforregularoperations. |
| • riskstocommunityhealthandsafety duetothetransport,storage,anduse and/ordisposalofmaterialssuchas explosives,fuelandotherchemicals duringconstructionandoperation? | | ✓ | Adequate measures for transportation, storage anddisposalwillbeimplemented. Regularmonitoring ofthesamewillbe conducted. |
| • communitysafetyrisksduetoboth accidentalandnaturalhazards, especiallywherethestructural elementsorcomponentsoftheproject areaccessibleto membersofthe affectedcommunityor wheretheir failurecouldresultin injurytothe communitythroughoutproject construction,operationand decommissioning? | | ✓ | Notanticipated. |

**A Checklist for Preliminary Climate Risk Screening**

**Country/ProjectTitle:**
**Sector: Subsector:**
**Division/Department:**

| ScreeningQuestions | | Score | Remarks# |
|---|---|---|---|
| **Location AndDesign ofproject** | Is sitingand/orroutingoftheproject(or itscomponents)likelyto beaffectedbyclimateconditionsincludingextremeweather relatedeventssuchasfloods,droughts,storms,landslides? | 10 | |
| | Wouldtheprojectdesign(e.g.theclearanceforbridges)need toconsideranyhydro-meteorological parameters(e.g.,sea-level,peakriverflow,reliablewaterlevel,peakwindspeed etc)? | 0 | |
| **Materials and Maintenance** | Wouldweather,current andlikelyfuture climate conditions(e.g. prevailinghumidity level,temperature contrastbetweenhot summer daysandcoldwinter days,exposuretowindand humidity hydro-meteorological parameters likelyaffectthe selectionof projectinputsoverthelifeofprojectoutputs(e.g. constructionmaterial)? | 0 | |
| | Wouldweather, currentandlikely futureclimate conditions,and related extreme events likely affect the maintenance (schedulingandcost)ofprojectoutput(s)? | 0 | |
| **Performanceofprojectoutputs** | Wouldweather/climateconditions,andrelatedextremeevents likelyaffecttheperformance(e.g.annualpowerproduction)ofaffect output(s) (e.g. hydro-power generation facilities) throughouttheirdesignlifetime? | 10 | |

Options for answers and corresponding score are provided below:

| Response | Score |
|---|---|
| NotLikely | 0 |
| Likely | 1 |
| VeryLikely | 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 includeproviding 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

OtherComments:_

Prepared by:

# Ifpossible, providedetailsonthe sensitivityofprojectcomponentsto climateconditions, suchashow climate parametersare consideredindesign standardsforinfrastructure components,how changes in keyclimate parametersand sea level mightaffectthesiting/routingof project, the selectionof constructionmaterial and/or scheduling, performancesand/or themaintenancecost/scheduling ofprojectoutputs

**Appendix 10: SAMPLE ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE**

***This template must be included as an appendix in the IEE that will be prepared for EACHsub- 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 | Statusof Subproject | | | | OfWorks | Progress ofWorks |
|---|---|---|---|---|---|---|---|
| | | Design | Preconstruction | Construction | Operational Phase | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Compliance status with national/state/local statutory environmental requirements

| No. | Subproject Name | StatutoryEnvironmental Requirements | Status of Compliance | Action Required |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Compliance status with environmental loan covenants

| No.(List Scheduleand ParagraphNumber ofLoanAgreement) | Covenant | Status ofCompliance | 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 (Listfrom IEE) | Parameters Monitored(Asa minimum,those identifiedinthe IEEshouldbe monitored) | Methodof Monitoring | Locationof Monitoring | Dateof Monitoring Conducted | Nameof PersonWho Conducted the Monitoring |
|---|---|---|---|---|---|---|
| **DesignPhase** | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **Pre-construction Phase** | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **ConstructionPhase** | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **OperationalPhase** | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Overall Compliance with EMP**

| No. | Subproject Name | EMP Partof Contract Documents (Y/N) | EMP Being Implemented (Y/N) | Status of Implementation (Excellent/ Satisfactory/Partially Satisfactory/ BelowSatisfactory) | 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. | DateofTesting | Site Location | Parameters(GovernmentStandards) | | |
|---|---|---|---|---|---|
| | | | $PM_{10}$ µg/$m^3$ | $SO_2$ µg/$m^3$ | $NO_2$ µg/$m^3$ |
| | | | | | |
| | | | | | |
| | | | | | |

| Site No. | DateofTesting | 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. | Dateof Sampling | Site Location | Parameters(GovernmentStandards) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | pH | Conductivity µS/cm | BOD mg/l | TSS mg/l | TN mg/l | TP mg/l |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| Site No. | Dateof Sampling | Site Location | Parameters(MonitoringResults) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | pH | Conductivity µS/cm | BOD mg/l | TSS mg/l | TN mg/l | TP mg/l |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Noise Quality Results**

| Site No. | DateofTesting | Site Location | $LA_{eq}$(dBA)(GovernmentStandard) | |
|---|---|---|---|---|
| | | | Daytime | Nighttime |
| | | | | |
| | | | | |

| Site No. | DateofTesting | Site Location | $LA_{eq}$(dBA)(MonitoringResults) | |
|---|---|---|---|---|
| | | | 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 11: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT**

Project Name

Contract Number

---

NAME:

DATE:

TITLE:

LOCATION:

DMA:

GROUP:

WEATHER CONDITION:

INITIAL SITE CONDITION:

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____Incident _____ Resolved ___Unresolved___ _____

INCIDENT:

Nature of incident

Intervention steps:

Incident issues:

Resolution

| | | |
|---|---|---|
| Projectactivity | Survey | |
| | Design | |
| | Implementation | |
| | Pre-commissioning | |
| | Guarantee period | |

**Inspection**

| | |
|---|---|
| Emissions | Wasteminimization Air quality |
| | Reuseandrecycling Noisepollution |
| | Dustandlittercontrol |
| Hazardoussubstances | Trees andvegetation |

Siterestored tooriginalcondition Yes No

Signature

_____

**Sign off**

Name Name

Position Position

**Appendix 12: CONSTRUCTION SITE CHECKLIST FOR EMP MONITORING**

Project Name: _____ Name of the Contractor:

Monitoring Details: Yes (√) No (x)

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 CETP 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 13: 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.

<table>
<tr><td>Date</td><td>Place of registration</td><td colspan="4">ProjectTown<br><br>Project:</td></tr>
<tr><td colspan="6">Contact information/personal details</td></tr>
<tr><td>Name</td><td></td><td>Gender</td><td>* Male<br>* Female</td><td>Age</td><td></td></tr>
<tr><td>Home address</td><td colspan="5"></td></tr>
<tr><td>Place</td><td colspan="5"></td></tr>
<tr><td>Phone no.</td><td colspan="5"></td></tr>
<tr><td>E-mail</td><td colspan="5"></td></tr>
<tr><td colspan="6">Complaint/suggestion/comment/question Please provide thedetails(who,what,where, and how)ofyourgrievance below:<br><br>if included as attachment/note/letter, pleasetickhere:</td></tr>
</table>

| **How do you want us to reach you for feedback or update on your comment/grievance?** |
|---|
| |

**FOROFFICIAL USE ONLY**

| **Registeredby:**(Nameofofficial registeringgrievance) |
|---|
| |
| **Mode ofcommunication:**<br><br>Note/letter<br><br>E-mail<br><br>Verbal/telephonic |
| **Reviewedby:**(Names/positionsofofficials reviewing grievance) |
| |

| **Action taken:** | |
|---|---|
| **Whetheractiontaken disclosed:** | Yes No |
| **Means ofdisclosure:** | |

**Appendix 14: Records of Public Consultation**

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

| **Dateand Venueof Public Consultation** | **Numberof attendees** | **Issues/concerns raised duringthe publicconsultation** | **Response of the EA/IAon howto address theissues and concerns** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Attachments:

Attendance sheets

Photo documentation

## Appendix 15: Environmental Audit – Semi annual monitoring report submitted to MoEFF&CC

Semi-annual monitoring report submitted to MoEFCC as Environmental Audit report is enclosed as separate file.

### I. Observation of review of Allotment letter of individual Industry

Review of allotment letter has been conducted to verify the environmental obligation of the industry owner to fulfill the environmental obligation of the APIIC. In this regard allotment letter no 299/11/APIIC/IP Naidupeta/Nellore/2018 dated 23/10/2018 allotted to M/s Wheels Indian Limited has been reviewed. There are 49 terms of condition in the allotment letter. The relevant experts related to environmental compliance are given below.

- M/ Wheels India Limited has been allotted plot No.Pl.No.15A (Block-C),Pl.No.15B (Block-C),Pl.No.16 (Block-C) at Industrial Park IP NAIDUPET, Nellore District (A.P) measuring 68388 Sq. Mts / Ac.16.89 for setting up of ' Engineering ' industry on Out Right Sale (ORS) basis subject to the following terms and conditions.
- M/s Wheels Indian Limited will bear the cost of sewerage lines passing through the area and pay propertytax also as and when demanded and also furnish an UNDERTAKING to that effect.
- Possession of the plot/land has been taken under the provisions of the Land Acquisition Act by APIIC Limited and as such the land acquisition cost has not been finalized. In the event of Civil Courts ordering enhanced compensation at the instant of the persons affected in land acquisition at the later date, enhanced compensation will be apportioned to all the allottees in respect of the land/plot allotted to them and the said proportionate cost shall be paid by individual industry.
- The allotment and occupancy of the land is subject to adherence to the directives issued by the State Board for prevention and control of Water and Air pollution. The allottee should undertake for the treatment and disposal of effluents as prescribed by the APPollution Control Board. An undertaking to this effect should be given in Proformaprescribed on Rs.100-00 non-judicial stamp paper.
- Allottee shall comply all the time with applicable environmental standards stipulated by statutory authorities and shall aware of any new modifications in the standards/notifications etc. In case of non-compliances, APIIC shall have the right to close the operations of the industries. Allottee shall document all environmental activities with proper attestation all the time.
- Allottee shall keep copies of all the environmental regulations, EIA report, EC clearance, MoEF/PCB investigation reports and all other relevant Environmental documents in place all the time for inspection by APIIC at any time.
- Allottee shall abide by the Country fly ash utilization regulations. Possibilities of utilization of fly ash for bricks and other uses during the construction stages shall be explored. Ready mixed concrete must be used in the building construction.
- Allottee shall provide copies of environmental compliance reports submitted to APPCB and/or MoEF to the APIIC as well.
- The groundwater shall not be drawn at any stage in the Industrial Parks/IDP/Special Economic Zones (SEZS) without prior written consent of the competent authority and the APIIC.

- Allottee shall adopt water reuse and water recycling methods for water conservation. Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices of sensor based control.
- For storm water collection, the allottee shall provide drainage system within theirpremises. It is mandatory for industries to provide rainwater harvesting pits within theindustry premises for harvesting rain water. Before reaching the roof/surface run off tothe pit, pre-treatment must be done to remove the suspended matter, oil and grease.The excess storm water should be discharged into the common storm water drainageof the Industrial Park/Special Economic Zone (SEZ).
- Allottee shall minimize waste generation by adopting suitable techniques and the details of such measures are to be provided to the APIIC from time to time.
- Allottee shall adopt energy conservation measures and use renewable energy in all possible ways and such application of techniques shall be provided to the APIIC from time to time.
- Allottee should make all arrangements for proper disposal of garbage/waste at regular intervals and keep the premises inside and outside of the unit as clean and hygienic.
- The allottee shall provide proper fire, safety and hazard management facility within their premises. A first-aid room shall be provided in the project both during construction and operation of the project.
- Construction spoils including bituminous material and other hazardous materials must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.
- The allottee shall have arrangements for effective hazardous and non hazardouswaste collection, segregation, storage and management system. The allottee shallhave a temporary storage facility for 30 days detention and hazardous wastes shall beperiodically disposed off to nearby approved treatment, storage and disposal facility(TSDF). Industries having hazardous waste shall obtain necessary authorization fromAndhra Pradesh Pollution Control Board (APPCB) for handling/ storage/ treatment/disposal.
- APIIC authorities have the right to enter into unit premises for checking and inspection of unit at any time. The Allottee shall not withhold any information pertaining to Environmental Management of their units. In case of non compliance or not submitting the desired information to APIIC, necessary action for cancellation of allotments or closure of unit, as deemed fit, would be initiated.
- The Allottee shall not take up any activities, due to which the property of APIIC such as roads, green belt, drainages, street lights etc. may be damaged. In case of noncompliance, APIIC may revoke the allotment orders or collect the fine from the allottee as deemed fit.
- Allottee shall adhere to the provisions for Water (prevention and Control of Pollution), Act 1974 the Air (Prevention and Control of Pollution), Act 1981, the Environment (Protection) Act 1986, the Public liability (Insurance), Act 1991 and EIA notification 2006 including amendments and rules made thereafter.
- Allottee shall monitor the emissions, effluents, wastes, stack emissions and their ambient air quality and water quality within their premises periodically after commissioning of project.
- The allottee has to provide sufficient budget for environmental protection measures as directed by the Pollution Control Board.
- All top soil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.

- Use of glass should not be more than 40% of building envelope to reduce the electricity consumption and load on air conditioning. If necessary, use high quality double glass with special reflective coating in window.
- Roof should meet perspective requirement as per Energy Conservation Building Code by using appropriate thermal insulation to fulfil requirement.
- The D.G Sets shall be provided with adequate stack height as per norms.
- The allottee has to spend for Corporate Social Responsibility as per Companies Act 1956.
- The allottee has to provide employment to the land ousters/locals to the maximum extent based on their qualification/skills subject to minimum 20% of total requirement.
- Allottee has to establish their own Effluent Treatment Plant (ETP) in their premises to treat the effluent of their units discharge standards strictly as per the guidelines of APPCB, in case the CETP is not established by APIIC. Guard pond with five compartments for 5 days storage capacity shall be constructed by the allottee so as to test the treated waste water before utilizing the same for flushing, washing, gardening etc. Quality of treated effluent reaching the guard pond shall be continuously monitored and in case the treatment is not adequate there shall be arrangement to recycle the effluent from the guard pond through the CETP. In case the CETP is established at park level by APIIC/ co-developer, pre-treatment has to be done by the allottee himselfto meet the inlet standards of CETP.
- Allottee has to make their own arrangements to manage/treat the domestic sewage by constructing septic tank or sewage treatment plant (STP) in their premises as per norms, the quantity of sewage, in case no sewage disposal system is provided by APIIC at park level. No waste water shall be discharged outside the premises.
- There will be no recharge of ground water by industrial effluent.

**II. Compliance with Applicable National and State Laws, Rules, and Regulations**

| Law, Rules, and Regulations | Description and Requirement | Status |
|---|---|---|
| | | *Y = compliant (if applicable, specify expiration date of permit/clearance)*<br>*N = non-compliant*[1]<br>*N/A = not applicable (state justification)* |
| EIA Notification | The EIA Notification of 2006 states that environmental clearance is required for certain defined activities/projects. | Environmental Clearance has been obtained for the industrial park and regular monitoring has been conducted and half yearly monitoring report has been submitted to MoEFCC |

[1]Compliant = There is sufficient and appropriate evidence to demonstrate that the particular regulatory requirement has been complied with; non-compliant = clear evidence has been collected to demonstrate the particular regulatory requirement has not been complied with.

| Law, Rules, and Regulations | Description and Requirement | Status |
|---|---|---|
| Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989 | | NA for APIIC and applicable for Industries |
| Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments | | Mitigation measures are being followed as per the EMP. |
| Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments. | | Y Mitigation measures are being followed as per the EMP. |
| Environment (Protection) Act, 1986 and CPCB Environmental Standards | Emissions and discharges from the facilities to be created, refurbished, or augmented shall comply with the notified standards.<br>a. Wastewater disposal standards | Y Mitigation measures are being followed as per the EMP. |
| Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010 | Applicable ambient noise standards with respect to noise for different areas/zones | Y Mitigation measures are being followed as per the EMP. |
| National Institute of Occupational Safety and Health (NIOSH) Publication No. 2002-149 | Compliance with NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids | Y Mitigation measures are being followed as per the EMP. |
| Forest (Conservation) Act, 1980 and Forest Conservation Rules, 2003 as amended | As per Rule 6, every user agency, who wants to use any forest land for non-forest purposes shall seek approval of the central government. | Y Mitigation measures are being followed as per the EMP and Master plan. |
| Ancient Monuments and Archaeological Sites and Remains Rules of 1959 | No development activity is permitted in the "protected area," and all development activities likely to damage the protected property are not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology. | Not Applicable as this location is very far from the ancient Monuments |
| The Child Labor (Prohibition and Regulation) Act, 1986 | No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule are present. | Mitigation measures are being followed as per the EMP. |

**Conclusion & Recommendation:**

The prior existing industries and infrastructures are part of the industrial estate and also a part of the master plan of the Naidupeta industrial estate. An environmental impact assessment was conducted, and Environmental Management Plan was prepared by the NABET (National Accreditation Board for Education and Training) accredited consultant hired by APIIC for preparation of EIA and EMP and environmental clearance. Based on this EIA and EMP application was furnished to the expert appraisal committee of MoEFCC for environmental clearance. Subsequently environmental clearance was awarded. A regular monitoring is being conducted for construction and operation phase of the infrastructure and facilities. A half yearly environmental monitoring report is submitted to MoEFCC. The latest half yearly report submitted to MoEFCC has been reviewed. and it has been found that there is no residual impact of earlier facility and there is no cumulative impact of the current facility and earlier facility. The latest environmental half yearly report has been annexed as Appendix 15 in the IEE.

The audit of the individual industry is not possible for APIIC to conducted mainly due to two reasons

(a) APIIC has sold the plot to the individual industry owner with the terms and conditions of industrial policy. This has been obligated to industries through the conditions of contract of the allotment of the plot. A review of the allotment letter cum agreement was conducted by the environmental specialist of PMSC and an excerpt of the allotment agreement is given in the appendix 15.
(b) For individual industry has obligation to follow the laws, regulation and standards of the state government and central government. This is controlled and regulated by the AP state Pollution control Board.

Hence it can be concluded from the monitoring report of APIIC and the conditions of the allotment letter that there is no cumulative or residual impact implied to be addressed this sub-project

**Appendix-16 –Minutes of Public Consultation**

Minutes of Public Consultation held on 28.07.2015 is herewith enclosed with this report. The photographs and signature sheets are given below

| Photographs of Public consultation held on 28.07.2015 held at Naidupeta Mandal and Pellkur Mandal of Nellore | |
|---|---|
|  |  |
|   |  |

## Appendix 17: Applicable Ambient Air Quality Standards for India Projects

| Parameter | Location[a] | Applicable Standards Per ADB SPS[e] ($\mu g/m^3$) |
|---|---|---|
| $PM_{10}$ | Industrial Residential, Rural and Other Areas | 20 (Annual) [c]<br>50 (24-hr) [c] |
| | Sensitive Area | 20 (Annual) [c]<br>50 (24-hr) [c] |
| $PM_{25}$ | Industrial Residential, Rural and Other Areas | 10 (Annual) [c]<br>25 (24-hr) [c] |
| | Sensitive Area | 10 (Annual) [c]<br>25 (24-hr) [c] |
| $SO_2$ | Industrial Residential, Rural and Other Areas | 50 (Annual) [b]<br>20 (24-hr) [c]<br>500 (10-min) [c] |
| | Sensitive Area | 20 (Annual) [b]<br>20 (24-hr) [c]<br>500 (10-min) [c] |
| $NO_2$ | Industrial Residential, Rural and Other Areas | 40 (Annual) [b]<br>80 (24-hr) [b]<br>200 (1-hr) [c] |
| | Sensitive Area | 30 (Annual) [b]<br>80 (24-hr) [b]<br>200 (1-hr) [c] |
| CO | Industrial Residential, Rural and Other Areas | 2,000 (8-hr) [b]<br>4,000 (1-hr) [b]<br>100,000 (15-min)[d] |
| | Sensitive Area | 2,000 (8-hr) [b]<br>4,000 (1-hr) [b]<br>100,000 (15-min)[d] |
| Ozone ($O_3$) | Industrial Residential, Rural and Other Areas | 100 (8-hr) [b]<br>180 (1-hr) [b] |
| | Sensitive Area | 100 (8-hr) [b]<br>180 (1-hr) [b] |
| Lead (Pb) | Industrial, Residential, Rural and Other Areas | 0.5 (Annual) [b]<br>1.0 (24-hr) [b] |
| | Sensitive Area | 0.5 (Annual) [b]<br>1.0 (24-hr) [b] |
| Ammonia ($NH_3$) | Industrial Residential, Rural and Other Areas | 100 (Annual) [b]<br>400 (24-hr) [b] |
| | Sensitive Area | 100 (Annual) [b]<br>400 (24-hr) [b] |
| Benzene ($C_6H_6$) | Industrial Residential, Rural and Other Areas | 5 (Annual) [b] |
| | Sensitive Area | 5 (Annual) [b] |
| Benzo(o)pyrene (BaP) particulate phase only | Industrial Residential, Rural and Other Areas | 0.001 (Annual) [b] |
| | Sensitive Area | 0.001 (Annual) [b] |
| Arsenic (As) | Industrial Residential, Rural and Other Areas | 0.006 (Annual) [b] |
| | Sensitive Area | 0.006 (Annual) [b] |
| Nickel (Ni) | Industrial Residential, Rural and Other Areas | 0.02 (Annual) [b] |
| | Sensitive Area | 0.02 (Annual) [b] |

[a] Sensitive area refers to such areas notified by the India Central Government.
[b] Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009
[c] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. *Global update 2005*. WHO. 2006
[d] Air Quality Guidelines for Europe Second Edition. WHO 2000.
[e] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

## Applicable Ambient Noise Level Standards for India Projects

| Receptor/ Source | Applicable Standards Per ADB SPS[c] (dBA) | |
|---|---|---|
| | Day time | Night time |
| Industrial area | 70[b] | 70[b] |
| Commercial area | 65[a] | 55[a] |
| Residential Area | 55[a] | 45[a] |
| Silent Zone | 50[a] | 40[a] |

[a] Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.
[b] Guidelines for Community Noise. WHO. 1999
[c] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

## Applicable Drinking Water Quality Standards for India Projects

| Group | Parameter | Unit | Max. Concentration Limits[d] | Applicable Standards Per ADB SPS[a, c, d] |
|---|---|---|---|---|
| Physical | Turbidity | NTU | 1 (5) | 1 (5) |
| | pH | | 6.5 – 8.5 | 6.5 – 8.5 |
| | Color | Hazen units | 5 (15) | 5 (15) |
| | Taste and Odor | | Agreeable | Agreeable |
| | TDS | mg/l | 500 (2,000) | 500 (2,000) |
| | Iron | mg/l | 0.3 | 0.3 |
| | Manganese | mg/l | 0.1 (0.3) | 0.1 (0.3) |
| | Arsenic | mg/l | 0.01 (0.05) | 0.01 |
| | Cadmium | mg/l | 0.003 | 0.003 |
| | Chromium | mg/l | 0.05 | 0.05 |
| | Cyanide | mg/l | 0.05 | 0.05 |
| | Fluoride | mg/l | 1 (1.5) | 1 (1.5) |
| | Lead | mg/l | 0.01 | 0.01 |
| | Ammonia | mg/l | 0.5 | 0.5 |
| Chemical | Chloride | mg/l | 250 (1,000) | 250 (1,000) |
| | Sulphate | mg/l | 200 (400) | 200 (400) |
| | Nitrate | mg/l | 45 | 45 |
| | Copper | mg/l | 0.05 (1.5) | 0.05 (1.5) |
| | Total Hardness | mg/l | 200 (600) | 200 (600) |
| | Calcium | mg/l | 75 (200) | 75 (200) |
| | Zinc | mg/l | 5 (15) | 5 (15) |
| | Mercury | mg/l | 0.001 | 0.001 |
| | Aluminum | mg/l | 0.1 (0.3) | 0.1 (0.3) |
| | Residual Chlorine | mg/l | 0.2 | 0.2 |
| Micro Germs | E-coli | MPN/100ml | Must not be detectable in any 100 ml sample | Must not be detectable in any 100 ml sample |
| | Total Coliform | MPN/100ml | | |

[a] Bureau of India Standard 10200: 2012.
[b] Health-based guideline values.
[c] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.
[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

## APPLICABLE STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS (EFFLUENT)

| Pollutants | Units | Applicable Standard per ADB SPS [a, b, c] |
|---|---|---|
| | | |
| pH | pH | 6 – 9 [b] |
| BOD | mg/l | 20 [a] |
| COD | mg/l | 125 [b] |
| Total nitrogen | mg/l | 10 [b] |
| Total phosphorus | mg/l | 2 [b] |
| Oil and grease | mg/l | 10 [b] |
| Total suspended solids | mg/l | <50 [a] |
| Total coliform bacteria | MPN b / 100 ml | 400a [b] |

[a] Environment (Protection) Amendment Rules, 2017

[b] Health-based guideline values

[c] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

**Appendix 18**
**SOUTH ASIA REGIONAL DEPARTMENT**
**SAFEGUARDS INFORMATION LOG FOR SAUW PROJECTS**

| | | | |
|---|---|---|---|
| **Project:** | **IND: Visakhapatnam Chennai Industrial Corridor Development Program (VCICDP) Naidupeta Economic Zone Subproject – Naidupeta Economic Zone Subproject – Providing Bulk Water Facility and Summer Storage in Naidupeta Industrial Cluster** | | |
| **Loan No.:** | | **Package No.:** | **VCICDP-APIIC/01** |
| **Components:** | The bulk water system proposed for Naidupeta cluster include the following components<br>a) Intake works<br>b) Pumping Main<br>c) Summer Storage Tank<br>d) Water Treatment Plant<br>e) Transmission Main<br>f) Commissioning of the works (intake works, pumping main, summer storage tank, water treatment plant and feeder mains).<br>The bulk water for the Naidupeta cluster will be sourced from Kandaleru-Poondi Canal, also known as Satya Sai Ganga Canal developed under Telugu Ganga Project and the intake location is identified near Utlapalli village, which 20km west of Naidupeta Cluster. As per the policy of GoAP, 10% of water in each reservoir is allocated for industrial purpose. Therefore considering the policy as well as the water availability in Kandaleru Reservoir, GoAP has issued an allocation of 1 TMC water on proportionate acreage basis under industrial use to meet the industrial demands in Nellore and Chittoor districts. A copy of the Government order is included as Annexure 1 of the IEE. | | |
| **Contract Type:** | Civil works | | |
| **Date of IEE:** | February 2019 | | |

| **Draft IEE** | **Updated/Revised IEE** | **Others/Remarks** |
|---|---|---|
| | This updated IEE report has been prepared on the basis of detailed design, field investigations and assessments, 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 subproject package has been awarded its contract as of March 2018. The updated IEE includes a site-specific EMP. | The initial IEE prepared during project processing is uploaded at the ADB website and can be accessed at https://www.adb.org/sites/default/files/linked-documents/48434-002-ieeab-04.pdf<br><br>This updated / revised IEE for Providing Bulk Water Facility and Summer Storage in Naidupeta Industrial Cluster will be uploaded at the ADB website upon clearance. |

| | **Activity** | **Status** | | **Detailed Comments and Further Actions Required** |
|---|---|---|---|---|
| 1. | Environmental assessment has been satisfactorily conducted based on ADB REA Checklist | **Yes** | **No** | This updated IEE report has been prepared on the basis of detailed design, field investigations and assessments, surveys, stakeholder consultations and meetings. ADB REA checklist was used for preparing the draft IEE which has now been updated after detailed design. |
| | | X | | |

| | Activity | Status | | Detailed Comments and Further Actions Required |
|---|---|---|---|---|
| | and scoping checklist.[1] | | | |
| 2. | Environmental assessment based on latest project components and design | **Yes** | **No** | IEE report based on detailed design and latest project components. |
| | | X | | |
| 3. | Statutory Requirements[2] | NA | Forest Clearance | Since the proposed project sites are within the already allocated Industrial cluster zones of APIIC, it does not impact forest area and hence no Forest clearance is required. |
| | | X | No Objection Certificate | IEE " Table 2-1: Relevant Environmental Regulations provides details of required NOCs to be obtained. NOC copies as obtained and available are included in the SEMR.<br>Six monthly monitoring report of MoEFCC/ APPCB (Appendix-16 of IEE) provides details and confirmation of compliance. |
| | | | Site Location Clearance | Not required. The owner ship of the Land is with APIIC as employer of the contractor hence SLC is not required. |
| | | X | Environmental Compliance Certificate | Environmental Clearance (EC) has been obtained from Ministry of Environment and Forest (MoEF), individually for each component of the cluster. Statutory clearances can be downloaded from this link: http://www.apiic.in/Envirnoment+Clearance |
| | | X | Permit to Construct (or equivalent) | Consent for Establishment (CFE) has been obtained from Ministry of Environment and Forest (MoEF), individually for each component of the cluster.<br><br>Statutory clearances can be downloaded from this link: http://www.apiic.in/Envirnoment+Clearance<br><br>Consent for establishment (CFE) required for the following components: (i) diesel generators, (ii) hot mix plants, and (iii) vehicles emitting air pollutants |
| | | X | Permit to Operate (or equivalent) | Consent for operation (CFO) required for the following components: (i) diesel generators, (ii) hot mix plants, and (iii) vehicles emitting air pollutants, etc. are provided as available in the SEMR. |
| | | | Others | |
| 5. | Policy, legal, and administrative framework | Adequate | Not Adequate | Please refer IEE Table 2-1: Relevant Environmental Regulations wherein the required NOCs has been included in the table. A copy is included in the SEMR. |
| | | X | | |
| | | Frameworks included: | | |
| | | X | National regulation/law on EIA | |
| | | X | Environmental agency | |

[1] ADB Rapid Environmental Assessment Checklist for screening and categorization. Scoping Checklist ("No Mitigation Scenario" Checklist) for scope of IEE, identification of impacts and development of environmental management plan.

[2] If applicable, Include date accomplished or obtained.

| | Activity | Status | | | | Detailed Comments and Further Actions Required |
|---|---|---|---|---|---|---|
| | | X | Relevant international environmental agreements | | | ADB SPS applicable standards are provided in the IEE. |
| | | X | Environmental standards (IFC's EHS Guidelines) | | | |
| 6. | Anticipated environmental impacts and mitigation measures | Impacts and risks: | | Mitigation Measures: | | |
| | | | | Yes | No | |
| | | | Biodiversity conservation | | NA | **Not applicable.** The proposed subproject is part of SEZ area that consists of barren land. No rare or sensitive flora and fauna species in the site nor region. |
| | | | Pollution prevention and abatement | X | | **Applicable.** Noise and dust pollution will mainly come from construction activities (machinery, bulldozers, front end loaders, generators, etc).<br><br>Naidupeta industrial estates are far from the main city and will have minimal or no impact on neighboring communities.<br><br>Operation stage impacts are included in the IEE and suitable measures to meet the standard guidelines / requirements are provided. |
| | | | Health and safety | X | | **Applicable.** Mitigation measures for both occupational and community health and safety are being followed at site during construction. The same will be monitored and reported in the SEMR's. |
| | | | Physical cultural resources | | NA | **Not applicable.** Subproject is in an industrial estate free from PCR. There are no community property resources like temples, Churches, Masjids or community halls available within the project influence area. |
| | | | Cumulative impacts | | NA | **Not applicable.** No cumulative impacts |
| | | | Transboundary impacts | | NA | **Not applicable.** No transboundary impacts |
| 7. | Impacts from Associated Facilities[3] | Addressed | Not Addressed | None | | No associated facilities are in the subproject area. |
| | | | | NA | | |
| 8. | Analysis of Alternatives | Yes | | No | | As project is cat B, no analysis of alternatives needed and provided |
| | | | | X | | |
| 9. | EMP budget included | **Yes** | | **No** | | EMP budget included in the IEE in the section IX of the IEE. Environmental Monitoring is a part of BOQ and in scope of contractor. The monitoring as per plan will be conducted and reported in the SEMR's. |
| | | X | | | | |
| 10. | EMP implementation integrated in PAM and bid documents | **Yes** | | **No** | | IEE in the table of EMP includes pre-construction, construction and operation stage, |
| | | X | | | | |
| 11. | Consultation and | Yes | | No | | Public consultation details and minutes are given in the appendix 6 of the IEE |
| | | X | | | | |

[3] ADB SPS (Appendix 1 para 6) defines associated facilities as not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.

<table>
<tr><th></th><th>Activity</th><th colspan="3">Status</th><th>Detailed Comments and Further Actions Required</th></tr>
<tr><td></td><td>Participation</td><td colspan="2"></td><td></td><td></td></tr>
<tr><td rowspan="3">12.</td><td rowspan="3">Grievance Redress Mechanism</td><td colspan="2">Yes</td><td>No</td><td rowspan="2"></td></tr>
<tr><td colspan="2">X</td><td></td></tr>
<tr><td colspan="3">Description of GRM<br>Identification of GRC members</td><td>IEE Appendix-5 provides a copy of notification of GRM.</td></tr>
<tr><td rowspan="3">13.</td><td rowspan="3">Disclosure</td><td></td><td colspan="2">Endorsement to disclose on ADB website</td><td>May be disclosed after final formatting.</td></tr>
<tr><td></td><td colspan="2">Disclosed on project website</td><td>May be disclosed after final formatting</td></tr>
<tr><td></td><td colspan="2">Relevant information available to stakeholders and affected people in language and form they understand</td><td></td></tr>
<tr><td rowspan="2">14.</td><td rowspan="2">Mobilized PMU Environment Specialist</td><td>Yes</td><td>No</td><td rowspan="2">The PMU has appointed a Safeguards coordinator covering social and environmental safeguards. The environmental specialist of PMSC has been mobilized. The names and contact details are provided in the SEMR.</td></tr>
<tr><td>X</td><td></td></tr>
<tr><td rowspan="2">15.</td><td rowspan="2">Mobilized PIU Environment Specialist</td><td>Yes</td><td>No</td><td rowspan="2">The PIU environmental specialist has been mobilized and it has been reported in the SEMR</td></tr>
<tr><td>X</td><td></td></tr>
<tr><td rowspan="2">16.</td><td rowspan="2">Mobilized Environment Specialist at PMU level</td><td>Yes</td><td>No</td><td rowspan="2">The PMU has appointed a Safeguards coordinator covering social and environmental safeguards. The environmental specialist of PMSC has been mobilized. The names and contact details are provided in the SEMR.</td></tr>
<tr><td>X</td><td></td></tr>
<tr><td rowspan="2">17.</td><td rowspan="2">Mobilized Environment Specialist at PIU level</td><td>Yes</td><td>No</td><td rowspan="2">The PIU environmental specialist has been mobilized and it has been reported in the SEMR</td></tr>
<tr><td>X</td><td></td></tr>
<tr><td rowspan="2">18.</td><td rowspan="2">Awareness training on compliance to safeguard requirements</td><td>Yes</td><td>No</td><td rowspan="2">The training budget of INR 15,00,000 has been provided in section IX under EMP budget.</td></tr>
<tr><td>X</td><td></td></tr>
<tr><td>19.</td><td>Others/Remarks</td><td colspan="4">Names and Contact details of environmental safeguards personnel are provided in the SEMR. Provided below for reference:<br><br>
<table>
<tr><th>PIU/PMU</th><th>Designation</th><th>Name of Officer</th><th>Contact Details</th></tr>
<tr><td>PMU - VCICDP</td><td>Environmental Safeguards officer</td><td>Recruitment in process</td><td>Presently being overseen by Panchakarla Bhargava<br>bhargavapkarla@gmail.com</td></tr>
<tr><td>PMSC</td><td>Environmental Specialist (Position K9)</td><td>Anjay Kumar</td><td>Anjay.kumar@mottmac.com<br>+91-9313329631</td></tr>
<tr><td>APIIC</td><td>Environmental Officer Naidupeta</td><td>Mr. Suresh Babu</td><td>apiiceenlr@gmail.com<br>+917075920060</td></tr>
<tr><td></td><td>Environmental Officer Visakhapatnam</td><td>Mr. Kompala Ravi</td><td>eeapiicvskp@gmail.com<br>+919705428890</td></tr>
<tr><td>APRDC</td><td>Environmental Safeguards Officer</td><td>Ms. V. Sowjanya</td><td>Sowjanya.roads@gmail.com<br>+918008887713</td></tr>
<tr><td>APTRANSCO</td><td>Environmental Safeguards Officer</td><td>Mr. B. Purushotham</td><td>+91-8332983756</td></tr>
<tr><td>GVMC</td><td>Dy. Executive Engineer, Environmental & Social Safeguards Officer</td><td>Mr. B. Maheswar</td><td>+91-9912255228</td></tr>
</table>
</td></tr>
</table>

Prepared by: Anik Ajmera, Environment Safeguards Consultant, SAUW

Noted and Checked By: Zarah C. Pilapil, Associate Safeguards Officer (Environment)
Documents/References: Updated IEE sent by PD VCICDP